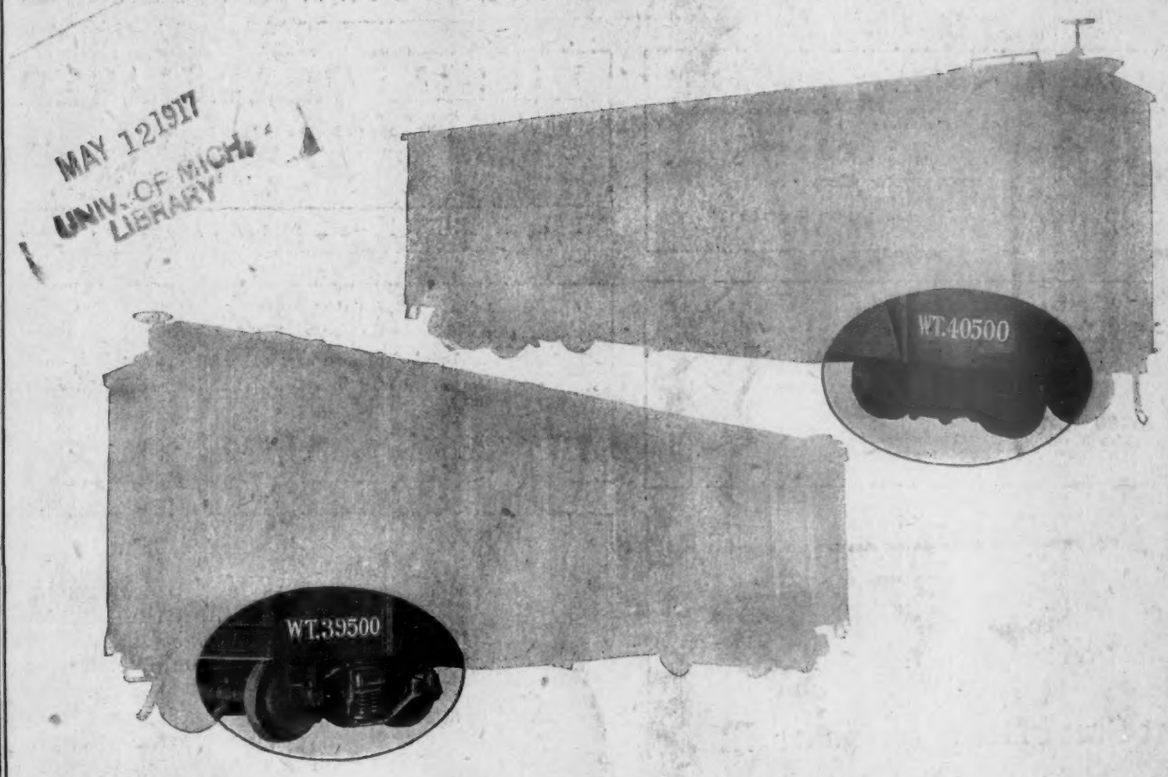
Railway Age Gazette

FIRST HALF OF 1917—No. 19 SIXTY-SECOND YEAR

NEW YORK: Woolworth Building
CHICAGO: Transportation Building

NEW YORK—MAY 11, 1917—CHICAGO

CLEVELAND: Citizens Building
WASHINGTON: Home Life Bldg.



MAY 12 1917
UNIV. OF MICH.
LIBRARY

1000—One Thousand Pounds—1000

The Bettendorf Truck saves **1000 lbs. dead weight,** which means $10.00 per year throughout the life of the car and pays **twice the total cost of the trucks** before the car has outlived its usefulness.

Their:—Light Weight—Simplicity—
Reliability—Low Cost of Maintenance—

have created such a demand for Bettendorf Trucks that our foundry had to be again enlarged this year to double the capacity which is now the largest unit steel castings plant in the United States.

THE BETTENDORF COMPANY

General Office and Works—Bettendorf, Iowa

New York
Grand Central Terminal

Chicago
McCormick Bldg.

St. Louis
Commonwealth Trust Bldg.

Alphabetical Index to Advertisements, Page 5

Classified Directory of Advertisers, Page 6

CHASE GOAT BRAND PLUSHES AND CHASE IMITATION LEATHER

Quality standards are fixed and dependable

Several months ago a seat cover of Chase Plush was sent to us with the statement that it had been in continual service for twenty-four years

L. C. CHASE & CO.

89 Franklin Street, BOSTON. 326 W. Madison Street, CHICAGO. 321 Fourth Avenue, NEW YORK. 303 Majestic Bldg., DETROIT.

THERMOSTATIC CONTROL
PRESSURE VAPOR
GOLD SYSTEMS
COMBINATION ELECTRIC
HOT WATER—VENTILATION

IS YOUR HEATING MAINTENANCE CHARGE HIGH? WHY NOT APPLY A SYSTEM THAT WILL CUT THIS IN HALF?

Gold's Thermostatic Control System Saves 50% in Steam Consumption, Uses Less Pipe and Fittings—Positively Gives a Uniform Temperature.

Thermostatic Control Can Be Applied to Your Existing Systems.

GOLD CAR HEATING & LIGHTING CO., 17 Battery Pl., New York

RAILWAY UTILITY COMPANY

Sole Manufacturers

"Honeycomb" and "Round Jet" Ventilators for Monitor and Arch Roof Cars, and all classes of buildings; also **"Electric Thermometer Control"** of Car Temperatures.

721 W. FULTON ST. Chicago, Ill. *Write for Catalogue* 1328 BROADWAY New York, N. Y.

DICKINSON DEVICES

Cast Iron Smoke Jacks
Light Fire-Proof Smoke Jacks
Ventilators All Materials
Cast Iron Chimneys
Cast Iron Buildings
Telephone Booths

PAUL DICKINSON, Inc., 3354 South Artesian Ave., Chicago

SARCO MINERAL RUBBER ASPHALTS

SARCO No. 6 Waterproofing
SARCO Bituminous Putty
SARCO 5-M Paint
SARCO Refrigerator Compound
SARCO Mineral Rubber Floors
SARTAC-Damp-Proofing
SARCO R. S. A. Specifications
SARCO Roof Cement

SARCO PRODUCTS INSURE PURITY AND RELIABILITY
Promptness—Service—Efficiency

SARCO PETROLEUM PRODUCTS COMPANY
Formerly STANDARD ASPHALT AND RUBBER CO., and THE PETROLEUM PRODUCTS CO.
CHICAGO

Specify **BUCKEYE JACKS**

and be assured that you are getting the best jack in design, capacity and longevity that is manufactured

Send for Catalogue

BUCKEYE JACK MFG. CO. ALLIANCE OHIO

Universal

Cast Steel Drawbar Yokes
Draft Lugs
Cast Steel Draft Arms or Sills

Tandem Draft Gear REENFORCEMENT

Triples Capacity reduces recoil 25% (for old or new cars)

Universal Draft Gear Attachment Co.
Railway Exchange Building CHICAGO

Better Observance of Signals Is Obtained By Using Cab Signals

As developed in connection with the Simmen System, cab signals are practical, reliable, low in first cost and maintenance cost, and adaptable to a variety of traffic conditions.

Simmen Automatic Railway Signal Co.
1575 Niagara Street
Buffalo, N. Y.

Write for our booklet "Progressive Signalling"

American Wire Rope

FOR elevators, dredges, lumbering, mining, oil-well drilling, suspension bridges, stump-pulling, cranes, derricks, ships' rigging and every other form of wire rope use.

Ask for illustrated catalogue

American Steel & Wire Company
Chicago New York Cleveland Pittsburgh Worcester Denver

Export Representative: U. S. Steel Products Co., New York

Pacific Coast Representative: U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

Railway Age Gazette

Volume 62 May 11, 1917 No. 19

Table of Contents

EDITORIALS:
Canadian Northern Electrification 981
Fuel Costs and the Eight-Hour Day 981
A Hard Pull and a Long Pull 981
Shortening Engine Districts 982
A Suggestion to the Committee on Defense 982
Go Slow With Railroad Building! 984
The Canadian Commission's Reports 985
A Crucial Test for American Railways 985
Why Continue the Valuation? 986
Patriotism Does Not Mean Discrimination 987
New Books 987
LETTERS TO THE EDITOR:
The Function of the Distant Signal; F. P. Patenall 988

* Illustrated.

*Transportation "Efficiency" Up to Date 988
More Yard Limit Boards; J. L. Coss 988
MISCELLANEOUS:
*Carriers Present Evidence in Rate Case 989
George Bury on the American Railways in the War 997
An Increase in Freight Rates of 3.683 Cents a Week 998
*Canadian Northern Electrification at Montreal; W. C. Lancaster 999
The War Taxation Bill 1003
How Much Railroad Equipment Is Needed to Move an Army 1003
Railway Regiments to Go to France 1004
*The Air Brake Association Convention 1005
How to Increase Railroad Efficiency 1010
Derailments Due to Defective Equipment; William Queenan 1012
Accident Prevention on the Northern Pacific 1012
*Pennsylvania Track Elevation at Johnstown, Pa. 1013
GENERAL NEWS SECTION 1018

Canadian Northern Electrification

It is specially appropriate that the newest transcontinental railroad should take advantage of the most modern form of motive power to operate its principal terminal. The difficulties of financing and constructing the line over thousands of miles of mountains and plains had been overcome by older methods but it required the construction of an electrified tunnel to secure a suitable entrance into the city of Montreal and to make possible an adequate return on the tremendous investment required for such an undertaking. As described in another part of this issue, the Canadian Northern gains access to the heart of the city through a tunnel 3.3 miles long through the Mount Royal hill back of the city. The only alternative was to make a round-about entrance to the city over either the Grand Trunk or Canadian Pacific tracks, neither of which offered a satisfactory terminal for passenger traffic. The large investment required for the new terminal would probably be out of the question for a road serving such thinly populated territory as the Canadian Northern, were it not for the prospect of heavy suburban traffic between the downtown and the new suburban district made accessible by the tunnel; and it would not be possible to develop or handle such suburban traffic if steam power were used in the tunnel. The success of electrical operation is assured by experience on other lines, and as a system was chosen suitable for operation over long distances, it is possible that electrification may later be extended to one or more divisions. The opportunity for profitable electrical operation is rendered still more favorable by the cheap hydro-electric power which is available.

Fuel Costs and the Eight-Hour Day

The present situation in the cost of locomotive operation is exceedingly serious. It demands the most careful study and prompt action. Current reports indicate that the railways will be called upon to pay as much as a dollar a ton more for fuel this year than last. This means an increase in operating expenses for this item alone, of over $130,000,000, an amount that is between 20 and 25 per cent of the net operating income, and between 70 and 75 per cent of the dividend appropriations of the railways for the fiscal year ending June 30, 1916. Everything that can be done must be done at once to combat this situation. It is not a mechanical department problem alone. The transportation department can do a great deal in conserving the fuel supply. Neither department can accomplish much alone; each must consider the problems of the other and the greatest harmony must exist between the two. There needs be a readjustment of practices that have been followed in the past, to meet the conditions of the present and the future. Many plans that heretofore have been believed impractical, must be reconsidered, to see if they will meet the present conditions. To partially overcome the $50,000,000 increase in operating expenses due to the eight-hour day law, the time between terminals must be if they will meet the present conditions. To partially overcome the $50,000,000 increase in operating expenses due to the eight-hour day law, the time between terminals must be decreased. This can be done by eliminating the delays while on the road and by increasing the power and the efficiency of the locomotives. All three of these items will also result in a decrease in locomotive fuel consumption. It might even prove practical to give some freight trains the right of way over certain passenger trains. The power and efficiency of the locomotives can be increased by maintaining them in proper condition and in many cases equipping them with capacity increasing devices. With the present demand for transportation facilities, there is no time to wait for new equipment. The greatest service must be obtained from the locomotives on hand by judicious expenditures and by proper handling.

A Hard Pull and A Long Pull

"But it has taken all the belligerent nations in this world war, who are not directly under invasion, a long time to think as at war rather than at peace," said George Bury, vice-president of the Canadian Pacific in an interview last week. The United States one month ago announced its stand in opposition to autocracy and the rule of might. In the time that thus far has passed the American people with feverish haste have taken steps to put themselves in the position of an active ally to France and Britain. The United States is a mighty nation; industrially it is the leading nation of the world. As things point today its industrial efficiency and prowess

are destined to play a great, perhaps a leading part in the work that lies before the democratic nations of the globe—the work of proving that the adage that "might makes right" is but a relic of the middle ages. It is hard for Americans to understand why Germany should have incurred the wrath of the American people and should have made such an error as to bring down upon itself the power of American industry. But we must not think that the mere entrance of the United States into active participation is going to end the war. Even today, as the French and British turn back the invader from the soil of France, they are still in France, and the Teutonic Empires do not yet know the demoralizing feeling of invasion of their own home soil. Russia is doubtful; there are suggestions that she may not again present an aggressive military stand for another twelfthmonth. The submarine campaign waxes more successful day by day. American ingenuity may help to solve the problem, but it has not solved it yet. In short, this is not going to be a short war, even for America. There will be no excuse whatsoever for Americans to make the mistake of believing in the short-war fallacy that was almost the undoing of England. Says Pomeroy Burton, the English publisher now in America, "The best informed military experts believe today that the war is *not* nearly over. They believe its worst and most dangerous stages are yet to come." The American railways for the past several years have been severely handicapped. American railway men have a harder problem ahead, and it will extend over many months. But if American railway men will realize that America must fight almost as if she were opposing German autocracy alone, and if they will realize that the conflict will be a long and a hard one, we have no fears for the future of the American railroads.

Shortening Engine Districts

Following the adoption of the basic eight-hour day in train service on January 1, the roads now have the choice of paying the overtime accruing with the tonnage per train handled previously, reducing the train loading to enable trains to get over the road faster, or shortening the engine districts. A number of roads are now considering the latter alternative and the relocation of railroad terminals has already been undertaken in a few instances. It is interesting to note the tendency towards the shortening of engine districts during recent years. On the railroads built years ago runs of 150 to 200 miles were frequent. Following the passage of the law limiting the hours of service of train employees to 16, the frequency with which trains were tied up on the line on the longer districts because of this restriction led to the shortening of many of them. As 100 miles is commonly considered one measure of a day's work this distance is commonly exceeded in order to avoid the payment of constructive mileage. As indicative of recent tendencies in the location of terminals the average freight run on the Pacific Coast extension of the Chicago, Milwaukee & St. Paul, one of the longest lines built in recent years, is 117 miles. On the Western Pacific, a road built about the same time, the average freight run is 116 miles. Now that the men have secured an eight-hour basic day, it is natural to expect that in the next negotiations they will renew their demands for time and a half for overtime. It is probable that a number of roads which are now considering the relocation of their terminals to shorten the runs are moving in anticipation of this procedure. One road which required improved facilities is now building two new terminals preparatory to the abandonment of one terminal and the dividing of two engine districts into three. On another portion of this same line plans are also being prepared for the division of four engine districts into five. The problem is largely an economic one. In some instances the scarcity of adequate supplies of water, the location of ruling grades and other operating or traffic considerations fix the location of terminals within relatively narrow limits. In general, however, they can be located where operating conditions demand. In relocating a terminal a considerable investment in buildings and tracks must necessarily be sacrificed, but this can frequently be done with resultant economy through the reduction in operating expenses. The subject is one which warrants careful consideration today, both in view of the conditions now existing and those which may confront the railways in the next few years.

A SUGGESTION TO THE COMMITTEE ON DEFENSE

EXTRAVAGANTLY radical as it may sound, the Executive Committee of the Special Committee on National Defense of the American Railway Association, of which Fairfax Harrison, president of the Southern Railway, is chairman, can, by a single set of orders, release for freight service or for the movement of recruits or other special war time transportation some hundreds of locomotives and three or four times this many passenger cars and can eliminate service costing probably more than thirty million dollars a year, detracting hardly any from the service which is now being rendered the public. Competition for freight through the cutting of rates has for a number of years been almost eliminated, but competition for passenger business through the duplication of passenger service has steadily grown until today there are hundreds of fast luxurious trains run in passenger service that are a dead waste to the railroads taken as a whole and add nothing, or almost nothing, to the service rendered the traveling public.

While the roads were being operated independently in the interests of their stockholders and the public, this duplication of service was justifiable in the sense that each road could in most cases show that by competing it was getting a certain small margin of profit which if it had not competed would have gone to one or more other roads. The fiercest competition for through passenger business is between such cities as Chicago and St. Paul and Minneapolis, Chicago and St. Louis, Chicago and Kansas City, Chicago and Portland and Seattle, Chicago and New York, New York and Philadelphia, New York and Washington, etc. Rival roads run trains leaving at almost precisely the same time and making about the same speed, vying with each other in elaborateness of equipment and, where the service is at night, adding cars enough so that comparatively few upper berths are sold, thus doubling the amount of dead weight carried for each passenger.

No real conception of how great a waste is going on here can be had until competing train schedules are examined in detail. In time it may be found necessary, or at least very desirable, to actually cut down passenger service and to discourage passenger travel by eliminating much of the luxury which has come to be accepted as a matter of course on fast through trains. Dining car service could be very much cut down; observation cars and club smoking cars could be entirely dispensed with; but the present discussion proposes that before the public is asked to sacrifice anything at all the railways themselves, through co-operation and the elimination of trains which are run purely for competitive purposes, conserve for other uses, fuel, trainmen's services, and locomotives and cars which are now, although in many cases yielding a return to the individual road, viewed on a certain basis, actually a dead loss of transportation facilities to the railways as a whole and to the country as a whole. Before going into this proposal in more detail it might be well to explain the distinction which is here made between yielding a return to an individual road on a certain basis and being a dead loss to the railways as a whole.

It costs from 70 cents to $1—in some cases even more—to pay out of pocket expense of running a passenger train a mile. This means simply enginemen and trainmen's wages, fuel, lubricants, engine house expenses and repairs of the equipment necessitated by this service; it does not include any part of the maintenance of way and structures, the pay of officers and clerks which are necessary to run the railroad as a whole, the law expenses and all other overhead charges; neither does it include any part of that really very great expense, indeterminable exactly, but nevertheless real, which is incidental to fast passenger service, which is the result of delays to freight trains and to local passenger service. The passenger traffic department of a railroad figures that if a train can be made to earn something more than this out of pocket cost of running it, it will do something toward paying overhead charges, etc., and therefore it is profitable to run. But the running of this train, if it is in competitive service, adds nothing to the total amount of travel; the passengers would have made the journey in any case on just as good a train at the same price. The individual road, however, figures that by running this train in competitive service it can get some of the profit which otherwise would have gone to another road.

It is not the purpose of this discussion to venture any opinion one way or the other as to whether under previously existing conditions this growth of competition in passenger service has been an economic gain or loss to the country as a whole. It can be urged that it has raised the standard of passenger service immensely. On the other hand, and with equal force, it can be urged that by throwing a disproportionately heavy burden of overhead charges on other service it has robbed Peter to pay Paul. Whatever the conditions in the past, however, the practical impossibility of eliminating a part of this service has appeared to be insurmountable. With the creation of the executive committee of the Special Committee of National Defense of the A. R. A., however, the elimination of this waste has suddenly become perfectly feasible, not, of course, without technical difficulties, but nevertheless entirely practical.

To demonstrate this the *Railway Age Gazette* has taken two striking examples of fast through competitive passenger service and made an arbitrary elimination of a certain portion of it, and from this has made a rough estimate of the most obvious instances where such wasteful competition exists and a quite rough estimate of the total number of locomotives and cars and the total amount of money which can be saved for the country as a whole if the same principles are applied. It may well be that even in the two specific instances set forth in detail some one or more of the trains which we have suggested eliminating might be found to be justifiable on some ground and, on the other hand, that some trains which have not been eliminated might be found to be unjustifiable to continue. The suggested new schedules between New York and Philadelphia and Chicago and the Twin Cities are based on the principle that the public should continue, for the time being at least, to get just as much service as it now gets. The elimination of certain trains was arbitrary, as it will have to be if the executive committee orders a similar elimination of trains throughout the country. Of course, in case of such orders being issued by the executive committee the roads would be given an opportunity to justify the running of any trains which the committee proposed to eliminate before orders were finally put into effect.

The table "New York to Philadelphia" shows the present schedule of the Pennsylvania Railroad and its competitor, the Central of New Jersey-Reading. The entire line is low grade; the through service, as will be seen, is very fast, and by the elimination of the eight trains on the Pennsylvania each way each day and the ten on the Central of New Jersey the cutting down of local service would be entirely negligible. Almost the entire business of the trains eliminated is through passenger business between New York and Philadelphia. The elimination of 18 trains a day, round-trip, would mean the cutting out of 3,240 train-miles a day, releasing 18 locomotives and at least 100 passenger cars for other service; the freeing for use in other service of the track occupied by these 18 trains, and the saving of approximately $4,560 a day, or $1,368,000 a year.

It will be noted that no attempt has been made to eliminate service which is incidental to through service to cities beyond Philadelphia or from cities beyond Philadelphia. The trains in this service are starred in the table. A certain number of them would be eliminated under the general scheme outlined herewith to cut out the duplication of service. The figure of saving in money of $1,368,000 a year in this single instance of passenger service between two cities not 100 miles apart is arrived at by taking as the total average cost of running these trains $1.50 per mile. For our purpose and from the point of view of the public, the government and the railways as a whole, the full charge against the passenger train, including overhead charges and maintenance of way charges, should be included for the reason that the overhead and maintenance of way, which although indeterminate in amount is actually expended on this train, would be released for expenditure on some other service. In other words, while it is perfectly true that to run one of these trains in addition to service already being performed would cost out-of-pocket only about 80 to 90 cents, as it is now in the service between New York and Philadelphia, overhead, officers' time, and permanent way and structures are being utilized to the full and by the elimination of this passenger service, just that much additional service of other kinds, either freight or military, could be substituted.

NEW YORK TO PHILADELPHIA

Present Time Table — Leave New York		Time		Proposed Time Table — Leave New York		Time	
Pa.	C. of N. J.	Pa. Hrs.	C. of N. J. Hrs.	Pa.	C. of N. J.	Pa. Hrs.	C. of N. J. Hrs.
6.00 a.m.	5.40 a.m.	2¾	3	6.00 a.m.	5.40 a.m.	2¾	3
7.00	7.00	2	2¼	7.00	.....	2	...
7.20	.....	2¼	...	7.20	.....	2½	...
8.00	8.00	2	2	.....	8.00	...	2
8.04*	8.15*	2	2¼	8.04	8.15	2	2¼
8.08*	.....	2⅛	...	8.08	.....	2¼	...
8.30*	.....	2½	...	8.30	.....	2½	...
9.00*	9.00	2	2	9.00	.....	2	...
9.30	.....	2¼	...	9.30	.....	2¼	...
10.00	10.00	2	2	.....	10.00	...	2
10.08*	10.00*	2	2½	10 08	10.00	2	2¼
11.00	11.00	2	2	11.00	.....	2	...
11.08*	11.00*	2⅛	2	11.08	11.00	2⅛	3
12.00	12.00	2	2	.....	12.00	...	2
12.08 p.m.*	12.40 p.m.*	2¼	2¼	12.08 p.m.	12.40 p.m.	2¼	2¼
1.00	1.00	2	2	1.00	.....	2	...
1.08*	1.00*	2⅛	3	1.08	1.00	2⅛	3
1.24	.....	2½	...	1.24	.....	2½	...
2.00	2.00	2	2	.....	.....	...	2
2.04	2.00*	2⅛	2½	2.04	2.00	2⅛	...
2.08*	.....	2⅛	...	2.08	.....	2⅛	...
3.00	3.00	2	2	.....	3.00	...	2
3.34*	.....	2	...	3.34	.....	2	...
4.00	4.00	2	2¼	4.00	.....	2	...
4.04	4.00*	2¼	2¼	4.04	4.00*	2¼	2¼
4.20	4.30	2½	2¾	4.20	4.30	2½	2¾
4.35*	.....	2¼	...	4.35	.....	2¼	...
5.00	5.00	2	2	.....	5.00	...	2
5.02	5.15	2⅛	3	5.02	5.15	2⅛	3
5.30	.....	2½	...	5.30	.....	2½	...
6.00*	6.00	2	2	6.00	.....	2	...
.....	6.00*	...	2¾	.....	6.00	...	2¾
7.00	7.00*	2¼	2¼	.....	7.00	...	2¼
7.07	.....	3¼	...	7.07	.....	3¼	...
8.00	8.00	2½	2½	8.00	.....	2½	...
8.34*	.....	2	...	8.34	.....	2	...
9.00*	9.00	2	2¼	.....	.....	...	2¼
9.30*	.....	2½	...	9.30	.....	2½	...
10.00	10.00	2	2¾	10.00	.....	3	...
12.30* a.m.	12.30 a.m.	3	3	12.30 a.m.	12.30 a.m.	3	3
12.45	.....	3	...	12.45	.....	3	...
.....	1.30*	...	2½	.....	1.30*	...	2½

*Trains with destinations south or west of Philadelphia.

The Pennsylvania figured that in 1916 on the New Jersey division the average cost of repairs, depreciation, fuel, lubricants and engine house expenses were 25 cents per engine-mile; wages in the fast passenger service approximate for both the Pennsylvania and the Central of New Jersey—Reading 15 cents per mile; repairs of cars, between three

and four cents per mile each, making an average of, say, 25 cents a train. The Pennsylvania figures that total operating expenses, including overhead, on the New Jersey division per passenger train mile are $1.79. The saving of $1,368,000 is based on a figure lower than this so as to carry out the general purpose of being extremely conservative. It is based on a cost of $1.50 per train-mile.

The table showing the present schedules of the Chicago, Milwaukee & St. Paul, the Chicago, Burlington & Quincy, the Chicago & North Western, the Minneapolis, St. Paul & Sault Ste. Marie and the Chicago Great Western proposes the elimination of six trains each way each day. At $1.50 per mile this would be a saving of $8,400 per day, or $2,520,000 for a 300-day year. In the case of the Chicago-Twin Cities service it would be necessary to sell upper berths, where now by far the greater number of passengers travel only in lowers. This, however, would be the only diminution of excellence of service to the public and there is room for a great many extensive frills to be taken off the Chicago-Twin Cities service. It might in rare instances, both in the Philadelphia and the Chicago-Twin Cities service, be found necessary to run an additional section to some one train on some particular day; but this fact would hurt the force of the present argument not at all. As in the case of the Philadelphia service, it will be noticed that in the elimination of trains, through trains have not been eliminated except in a single instance where it would be perfectly feasible and proper, if that part of the service of the through train of the Soo were to be continued beyond the Twin Cities that that portion of the service from Chicago to the Twin Cities be performed by some other road and passengers be required to change cars at St. Paul.

It is not suggested that where three competing roads each have a train running between the same points, leaving at the same time, that all but one of these trains be eliminated, nor is it suggested that the splitting up of the present business as between competing roads should be done by simply shutting off one road's passenger service completely at a certain time of day. Take the two 20-hour trains between New York and Chicago, for instance—the New York Central's Twentieth Century Limited and the Pennsylvania's Broadway Limited. The New York Central's Twentieth Century does a good deal more business than the Pennsylvania train. Let Sunday service be eliminated entirely; let the New York who wanted a lower could buy a whole section, paying an extra half fare, however, to the railroad company in addition to the regular and present extra fare. The choice would always be left open to him to take a less expensive train or to take an upper.

In making an estimate of the competitive service which could be eliminated in no case have trains been eliminated which run at different times of the day. In the long through runs from New York to Chicago or Chicago to Denver or Los Angeles a different leaving time of half an hour or an hour has not been considered as making trains non-competitive. The following is not a complete list of all of the cities between which there is unnecessary competitive passenger service but gives a good idea of the general outlines of the situation:

Chicago to Twin Cities.	Chicago to Seattle.
Chicago to Kansas City.	Chicago to Detroit.
Chicago to Omaha.	New York to Philadelphia.
Chicago to St. Louis.	New York to St. Louis.
Chicago to Cincinnati.	New York to Jacksonville.
Chicago to Louisville.	New York to Buffalo.
Chicago to Cleveland.	New York to Montreal.
Chicago to Indianapolis.	New York to Washington.
Chicago to Pittsburgh.	St. Louis to Kansas City.
Chicago to New York.	Boston to Albany.
Chicago to San Francisco.	Philadelphia to Atlantic City.
Chicago to Los Angeles.	Los Angeles to San Francisco.
Chicago to Denver.	

At the very lowest estimate 70 trains each way each day could be eliminated between the cities indicated in the table. Roughly, this would be the elimination of 80,000 train-miles a day, and taking the cost of this service at the lowest reasonable figure the direct saving effected would be very large, while the increased capacity provided for handling military traffic and ordinary freight traffic would be very important. Before the war began it would have taken months or years of negotiations for the railroads to have effected any such reduction of passenger service and even if they could have agreed to do it, it is probable that public sentiment and regulating bodies would have prohibited it. It is probable on the other hand that the executive committee of the Special Committee on National Defense of the American Railway Association with the large powers which have been conferred upon it can accomplish this result.

GO SLOW WITH THE ROAD BUILDING!

THE railway officers who have come out so quickly in announcing their intention of assisting their employees and patrons with farms and gardens this summer have done a real service for the nation. The railways are assisting in

CHICAGO TO TWIN CITIES.

PRESENT TIME TABLE.
Leave Chicago.

C. M. & St. P.	C. B. & Q.	C. & N. W.	M. St. P. & S. S. M.	C. G. W.
6.30 p.m.	6.30 p.m.	6.00 p.m.	6.35 p.m.*	6.30 p.m.
—	—	6.45*	—	—
10.15*	10.15*	10.00	—	11.30
—	—	10.10*	—	—
8.15 a.m.	10.10 a.m.	8.30 a.m.	—	—
—	—	2.25	2.15 a.m.	—

PRESENT TIME TABLE.
Arrive Minneapolis.

C. M. & S. P.	C. B. & Q.	C. & N. W.	M. St. P. & S. S. M.	C. G. W.
7.50 a.m.	7.55 a.m.	7.55 a.m.	8.55 a.m.	8.05 a.m.
—	—	7.55	—	—
11.15	11.40	11.25	—	1.20 p. m.
—	—	10.25	—	—
10.20 p.m.	10.55 p.m.	10.55 p.m.	—	—
—	—	6.10	4.40 p.m.	—

PROPOSED TIME TABLE.
Leave Chicago.

6.30 p.m.	—	6.00 p.m.	6.35 p.m.*	—
—	—	6.45*	—	—
10.15*	10.15 p.m.*	10.10* }	—	—
—	—	10.10* }	—	—
—	10.10 a. m.	—	—	—
—	—	2.25 a.m.	—	—

PROPOSED TIME TABLE.
Arrive Minneapolis.

7.50 a.m.	—	7.55 a.m.	8.55 a.m.	—
—	—	7.55	—	—
11.15	11.40 a.m.	10.25 }	—	—
—	—	10.25 }	—	—
—	10.55 p.m.	—	—	—
—	—	6.10 p.m.	—	—

*Trains with destinations west or north of Minneapolis.

Central run its Twentieth Century on Monday, Wednesday Thursday and Saturday and the Pennsylvania its Broadway Limited on Tuesday and Friday. Practically none of the uppers are sold on either of these two trains now, so that through the elimination of one or the other of them each day and the sale of uppers it would not be necessary to run any more cars than are now run each day on the New York Central alone. If it were found that pressure was so strong for lowers that it could not be resisted, let a rule be put into effect that a man all kinds of ways, with seeds, with labor, with money, with transportation for workers, and the list of those who have advised their employees that they may cultivate unused railroad property includes nearly all the systems in the country. But the enthusiasm has been tempered by a very sensible insight into some of the difficulties that lie ahead. The most threatening one, of course, is labor. Railroads and farms alike have seen their working forces, their unskilled workers particularly, fairly melt away into the munition plants and

similar industries. The railroads have advanced wages, some of them have brought large numbers of negroes from the south, but still to no avail. Nevertheless, a number of the carriers have offered a portion of their section laborers to the farmers along their lines for the planting and the harvest season. This offer means much more than appears on the face of it, for no railroad at the present time can boast of any surplus of section labor.

The problem emphasizes very acutely a situation that has been getting worse and worse for months. The suggestion has been made that the United States should repeal or suspend its contract labor laws so as to bring in Mexicans or South Americans. Another, and a better one, is that the farmers should use boys as workers on their farms this season. Ralph Peters, president of the Long Island, said last week to the Food Problem Committee of the Merchants' Association of New York, "I believe it would be a good move if your association would request the state government through the highway department, to stop the building of highways in the state and to stop drawing on the farm labor for that purpose. I would not build any new roads now except those of military importance or importance in hauling food supplies. The highway department should not disturb the labor situation by paying fancy prices on state highway contracts." The road builders will, no doubt, take issue with Mr. Peters, but must agree that there are many cases where labor now working on roads could be used to better purpose elsewhere. The railways too, might have a word to say, for while good roads are needed so are good railroads and big crops. The railroads should use every effort to "put their house in order" and anticipate the future. The labor situation is not going to improve when the United States calls its citizens to the colors, and our country can take no chances with its railroads. Deferred maintenance of railway lines at any time, still less in war time, is serious; it is one of the several important things that are making Germany's military and economic situation so precarious.

THE CANADIAN COMMISSION'S REPORTS

THE Canadian railway situation is so complicated that anybody who has not studied it on the ground in all its phases would be presumptuous to suggest a solution of the problem it presents. In the issue of the *Railway Age Gazette* for last week we published summaries of both the majority and the minority reports of the members of the Royal Commission created by parliament to investigate and make recommendations upon this problem. Sir H. L. Drayton and W. M. Acworth in the majority report, and A. H. Smith, in a minority report, reach widely differing conclusions as to what action should be taken by the government. In view of the fact that they all agree on the general principle that government ownership and direct government management in a democratic country is undesirable, this wide variance in their recommendations is somewhat remarkable. The fact that men who agree on the general principle that government ownership in democratic countries ordinarily is undesirable nevertheless reach such different conclusions as to the best way in which to deal immediately with the Canadian problem simply illustrates the difficulty of the problem.

The headline placed over our article last week regarding the majority's report said that it "opposed government ownership." This was not strictly accurate. While the majority emphatically expressed its opposition to public ownership under ordinary conditions, it is a fact that if its plan should be adopted, the Canadian public would become the actual owner of the Canadian Northern, the Grand Trunk Pacific, and the Grand Trunk, in addition to its present properties, the Intercolonial and the National Transcontinental. In order to avoid the dangers and wastes ordinarily incident to government management, Sir H. L. Drayton and Mr. Acworth suggest an ingenious plan under which the management of both the properties the government now owns and those it would take over would be delegated to a board of trustees which would be independent of parliamentary influence and practically self-perpetuating. While this plan has much merit, there is great force in some of the criticisms which Mr. Smith makes upon it. Is it not a fact, as he suggests, that a board of trustees created by one parliament could be abolished by a later parliament? A point of hardly less importance is as to how the proposed plan would assure efficiency in management. The first board of trustees would be chosen by parliament. What assurance is there that parliament would select competent men? If the first board were not composed of competent men, those later elected to the board very probably would not be strong men and who is to call the trustees to account if they do not do their work well? They will be responsible only to public opinion and while public opinion can condemn them if it does not like the way they manage things, neither the public nor anybody else can cause their removal.

We shall take occasion later on to discuss the Canadian problem and the recommendations which have been made for its solution. Meantime we are obliged to hold the opinion that the plan suggested by Sir H. L. Drayton and Mr. Acworth would not serve the double purpose for which apparently it is put forward—that of avoiding the dangers incident to government management in a democratic country and at the same time securing the advantages that are usually conferred by private management.

A CRUCIAL TEST FOR AMERICAN RAILWAYS

THE action taken by the chief executive officers of the railways a few weeks ago when they delegated the supervision of the operation of all their lines to a committee of five was one of the most important events in the history of the railways of the United States. Its real significance and importance are only beginning to be realized by railway officers themselves. They have not yet begun to dawn upon the public.

Because of the radical and momentous character of that step and of the situation which it has created, it is desirable that certain features be emphasized for the information of both railway officers and the public. In the first place, the arrangement made does not affect the handling merely of military or even of government traffic. It affects the handling of every kind of traffic, military and non-military, passenger and freight.

During the period of the war the railways will have two widely different functions. First, they will have to handle strictly military traffic, troops, army and navy supplies, munitions and so on. Second, they will have to handle their ordinary commercial business. The former function, while its proper and adequate performance may in the long run prove vital to the nation, will, for some time at least, require only a comparatively small part of the facilities of the roads and the energies of their personnel. But the addition of the military traffic to the ordinary traffic will increase the difficulty of handling the latter. Before the war began the facilities as then used were not sufficient to the demands. The most difficult problem of the Central Executive Committee, so far as any one can now foresee, will be that of so utilizing the facilities and personnel as to make them furnish the transportation required for ordinary purposes.

The step taken by the railway heads to make it possible to solve this problem was revolutionary. It wiped out many of the competitive relations which always had existed. It tends to create a pool of all facilities, and to cause the railways to be operated as a single system. If all the railways of Europe were operated as a single system, neither the total

mileage nor the area covered by the system would be equal to the mileage involved and the area covered by the railway system placed under the supervision of the Central Executive Committee in the United States.

Aside from its revolutionary character the most significant and important feature of the action taken is that it is voluntary. When Great Britain entered the war its railways were turned over to a central committee under a law passed forty years before, their net return was guaranteed, and they became almost as much a department of the government as the army or navy. In the United States there was no law governing the railways in war; and the managements have made legislation unnecessary by doing voluntarily practically what the British railways were required to do. The committee of five which has been created to supervise the operation of our railways has sometimes been referred to as a subcommittee of the government's Advisory Committee on National Defense. It has no direct relationship to that or any other government body. If the managements of the railways had been forced by legislation to do what they have done they would not deserve much credit for it. They do deserve great credit because they have done it spontaneously in recognition of the needs of the country and of their patriotic duty.

The fact that the arrangement made is voluntary, and that net return is not guaranteed is bound to raise some extremely important and difficult questions which have not arisen in Great Britain. When the Central Executive Committee begins on a large scale actually to use the facilities of the railways as those of a single system it will affect the interests of individual lines to an important degree. Then will come the crucial test. No voluntary railway organization ever has been able to get all of the railways to subordinate their individual interests to the welfare of all. It has been an easy thing to get the British railways to do this because, first, the government required them to do it, and, second, no individual line had anything to lose by it.

The difference in these respects between the arrangement made in Great Britain and that made in the United States is what is going to make the problem of the Central Executive Committee of our railways very difficult. The success of the plan will depend, first, on the tact, self-restraint, fairness, wisdom and courage of the executive committee and, second, on the unselfishness, self-restraint and wisdom of the individual managements. If the individual managements will give the executive committee cordial support, it it probable that in the long run such large economies will be affected, that few or no individual lines will suffer, and that the railways as a whole will be greatly benefited. The economies which can be effected by really operating as a single system are large. Undoubtedly, differences of opinion as to the things which ought to be done will arise. But it does seem most apparent that the managers ought to fight these differences out absolutely among themselves, and that meantime they should loyally stick together and carry out in letter and spirit the injunctions of their own committee.

It is the conviction of many leading railway men that if they do not do this, the government will intervene. The *Railway Age Gazette* shares that view. If this should occur, would the central control be left in the hands of men selected by the railways? This is most improbable. If the government should intervene the railways would sacrifice the credit for having voluntarily rendered a great patriotic service regardless of their individual interests. Furthermore, under direct government control they undoubtedly would be managed less efficiently and economically. These are seemingly conclusive reasons why the railways should wash all their dirty linen in private and go on steadfastly throughout the war carrying out the present plan, or, if not, some better plan of their own making.

The whole future of our railways is now in process of determination. The unrestrained and excessive individualism which has characterized their management in the past has done them great harm. If allowed to assert itself during the war it probably would ruin them. On the other hand, by recognizing the fact that at least during the war their interests as a whole must be put above those of individual lines, and that the interests of the country must be put above those of the railways, they will serve the country as best they can and in doing so further their own permanent interests in the most effective manner.

WHY CONTINUE THE VALUATION?

IN view of the increasing doubt regarding the practical value of the results which will be secured from the railway valuation work under way and the great demands made of the railways and other industries to conserve and direct their energies to the primary task now confronting this country, many railway men believe that the Federal valuation work should be abandoned. Numerous industries have placed their facilities at the disposal of the government without profit, while others are so arranging their work that they may be able to be of the maximum assistance when called upon. Everywhere there is a desire to eliminate useless or unnecessary work in order to conserve both men and money.

An idea of the cost of the valuation work may be gained from the statement of Director Prouty before the House Committee on Appropriations recently. At that time he stated that $9,300,000 had already been spent by the government on this work and that the division of valuation would require $3,500,000 annually for the next four years. As the expenditures required of the roads to comply with the instructions of the government are considerably greater it may be estimated that the valuation work is now requiring a total expenditure of over $10,000,000 annually. Furthermore, the government and the railways have organized and are employing several thousand engineers and accountants in this work. These forces consist almost entirely of trained men whose service would be of great value to the government if turned in other directions. At a time when many railway engineers are leaving their roads to meet the call of the government it does not seem entirely consistent for the government itself to retain such a large force on this work, which is not aiding in military or industrial operations in any way.

Entirely aside from the consideration of the emergency which has arisen within the last few weeks there has been an increasing doubt in the minds of many for some months regarding the wisdom of continuing the valuation work because of the evident confusion into which this work has been thrown. Although the intent of the valuation law would appear clear and there was little doubt regarding the purpose of Congress in authorizing this work at the time the bill was under discussion, so many interpretations have been advanced by the state commissions and the partisan advisors of the division of valuation contrary to the plain intent of the law that the director stated at a recent hearing before the commission that he "would rather undertake to read the Chinese alphabet backwards" than to read the valuation act. Because of this confusion the division of valuation openly states that it has not attempted to comply with certain provisions of the act and has placed an interpretation on others widely at variance with that of the carriers. The most startling statement of all was that at the hearing in January when the director stated that the commission does not intend to prepare final valuations on the properties of the carriers, but is only endeavoring to ascertain and report on certain elements of value. If this decision is adhered to not only will the work which has been done be rendered useless, but it will result in positive in-

jury to the roads, since it will create confusion in the minds of the public regarding the real value of the railway properties and place in the hands of state commissions partial valuations which they will be free to use as they see fit to support their arguments.

In view of the unsatisfactory condition in which the valuation work now exists, the wisdom of continuing it under normal conditions would be questionable. Under present conditions with patriotic demands upon all activities, government and private, to conserve men and money, it would appear evident that the work should be discontinued.

PATRIOTISM DOES NOT MEAN DISCRIMINATION

ON April 17 leading representatives of the trade and technical papers of this country carried to Washington an offer on the part of 277 class journals of the nation to give editorial co-operation and free advertising space to support government activities in connection with the war. They were received by Secretary of the Navy Daniels; George Creel, recently appointed head of the Board on Censorship and Publicity; Grosvenor B. Clarkson, Secretary of the Council of National Defense, and Howard Coffin of the Advisory Board. The trade and technical journals of this country are leaders in its industry and their influence for good on industry's welfare is far greater than is generally realized. In this case, as in many other cases, they were first in offering real co-operation and in leading the way for other publishers to follow. While certain other publishers' organizations were arguing that advertising is a commodity just as much as bread or wheat or steel, and should be paid for, they offered their services directly to the nation, offered their advertising pages free of charge, the cost be what it might. Their offer was received gratefully.

But what have they in return from another quarter of our government? A threat on the part of Congress to raise their postage rates. It is hard to believe, but it is a fact that there is now under consideration in the House the same old proposal, now masquerading as a patriotic measure, to increase the postage rates on second-class mail. The proposal is incorporated in the war taxation bill, the provisions of which were agreed upon by the House Committee on Ways and Means last Tuesday. By the sections of this bill relating to the rates on postage it is provided "That on and after June 1, 1917, the zone system applicable to parcel post shall apply to mail matter of the second class, and the rates of postage shall be as follows: Two cents a pound or fraction thereof when for delivery within the first zone; 3 cents a pound or fraction thereof when for delivery within the second or third zone; 4 cents a pound or fraction thereof when for delivery within the fourth or fifth zone; 5 cents a pound or fraction thereof when for delivery within the sixth or seventh zone; 6 cents a pound or fraction thereof when for delivery within the eighth zone, etc.

The *Railway Age Gazette* last week weighed 14 ounces. It would have cost to send each copy to Philadelphia or Boston, three cents; to Pittsburgh, Chicago or St. Louis, four cents; to Denver, five cents; to Seattle or San Francisco, six cents. The subscription price is $5 yearly, not quite ten cents a copy, and so it is with other papers.

If these provisions are passed, the trade and technical papers will be severely handicapped and as instruments of educational value their work will be considerably hindered. Is this right? The trade and technical journals are patriotic. They have already proved their patriotism by the co-operation they have hitherto given the government in their editorial columns and by their offer of free advertising space. But in justice to their readers, they cannot feel that patriotism, however great, can allow the technical papers to be legislated out of business efficiency without the strongest protest of which they are capable. If the threatened postage rates are made effective, the subscription rates may have to be increased; papers now costing $5 may cost $7.50 or even $10 yearly. If the zone rates are made effective, it will be almost prohibitory to send copies from New York to the Pacific Coast. If subscription prices must be increased, circulation will be diminished and standards will have to be lowered in consequence.

The business papers welcome the opportunity to join with other industries in showing their patriotism. They are ready and willing to pay increased rates on first class mail matter, a reasonable stamp tax on each periodical issued if necessary, the income tax, the excess profits tax, etc., but in justice to themselves and the readers they serve, they do not feel called upon to give up their business to please the whims of Mr. Burleson, the postmaster general, or Mr. Moon, the sponsor for this legislation in the House of Representatives.

NEW BOOKS

Proceedings of the American Railway Bridge and Building Association. Edited by the secretary. 268 pages, illustrated. 6 in. by 9 in. Bound in cloth and paper. Published by the association, C. A. Lichty, secretary, Chicago & North Western, Chicago. Price $1.

This volume contains the proceedings of the twenty-sixth annual convention, which was held in New Orleans on October 17-19, 1916. In addition to the routine business of the Association, this book includes 194 pages of reports and discussions on topics of interest to men concerned with the maintenance of railway structures. Among the subjects presented were those on Intakes and Intake Lines; Floors for Engine Houses, Shops and Freight Houses; Paint and its Application to Railway Structures; Caring for and Handling Creosoted Timber; Modern Methods of Driving Piles; Efficient Methods of Handling Work and Men; Station Buildings for Passenger Service Only; Ecoonmical Handling of Concrete on the Smaller Jobs, and Small Coaling Stations. In addition to being of direct service to bridge and building men these proceedings will also be of interest to officers in the operating and other departments concerned more or less directly with these problems.

The Design of Railway Location. By Clement C. Williams, professor of railway engineering, University of Kansas. 517 pages, illustrated, 6 in. by 9 in. Bound in cloth. Published by John Wiley & Sons, Inc., 432 Fourth avenue, New York. Price $3.50.

The rather unusal title of this book is intended to cover the study of the physical and economic considerations governing the location of railways, together with an exposition of the principles and methods involved in the actual location of a line. The book is primarily a text for engineering schools, but is sufficiently complete in its treatment to be of value to the practicing engineer. The first part of the book is devoted to general considerations, an introduction covering the historical development of American railways and six chapters on the relation of railways to the public. The latter include an exposition of the common theories of valuation and a discussion of the federal valuation act. Most of the book is devoted to a discussion of the financial, operating and engineering considerations, entering into a determination of an economic location. Among subjects not covered in older books may be mentioned the chapter on the elimination of grade crossings which deals with the grade separation problem with which the railroads are confronted today. A chapter on line changes and grade reductions contains accounts of some of the most recent railway cut-offs. The last five chapters of the book are devoted to detailed instruction in the manner of making reconnaisance, preliminary location and construction surveys and railway construction estimates. The book indicates painstaking care and wide reading on the part of the author.

Letters to the Editor

THE FUNCTION OF THE DISTANT SIGNAL

BALTIMORE, Md.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read the letter from L. R. Clausen in your issue of April 6, and twice in this letter the railroads are very severely arraigned; they are accused of teaching enginemen to disregard the caution indication.

Of course, Mr. Clausen does not mean what he says, and therefore, that remark cannot be taken seriously. It is neither advisable nor necessary to again enter into a discussion of the question whether the railroads should attempt to transmit instructions by signal indication to enginemen so as to give them as much information as is possible, that they may intelligently handle their trains, or whether the method of simply giving only limited information, leaving the rest to conjecture, should be countenanced as good practice. The former has demonstrated its utility, and its greater safety; and the practice will stand any criticism that may be launched against it.

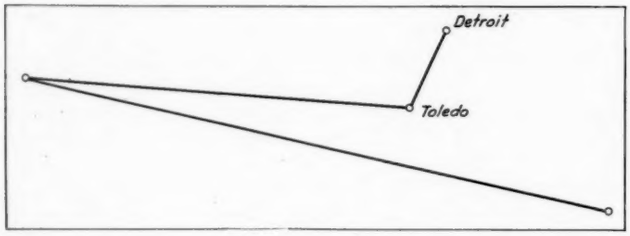
F. P. PATENALL,
Signal Engineer, Baltimore & Ohio.

TRANSPORTATION "EFFICIENCY" UP TO DATE

DETROIT, Mich.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Here is a little story of a freight car diversion which will interest your readers. The Executives' Committee at Washington has now announced that box cars virtually will be pooled, and this story is now useful mainly as history; let us hope so at least; but it ought to go on record. How many cars have been sent in a direction away from their owners' lines during the past few months, by a violation of the spirit of the send-home rule, no one can tell, but some railroad men believe it is hundreds of thousands. Certain it is that, under lawful reconsignment tariffs, innumerable shipments, started from A on a route north to B, and thence



east toward home, C, have been diverted at B, and sent west (away from home) to D. But to my story.

A certain consignee in this city, who illustrates his story by the geographical sketch shown below, is one of the thousands of receivers of freight, who, nowadays, find their business stagnated, if not killed, by the congestion of freight on the railroads; but also he is the fortunate possessor of enough money to pay for getting his freight moved, by hook or by crook, in spite of the most baffling conditions. Perhaps the ingenuity of the shipper should be credited with this accomplishment. At any rate, by the use of ingenuity and money, combined, the rigid National car service rules, which maddened shippers everywhere, were circumvented.

A certain shipment of freight, occupying a single car, had been held for sometime at the manufactory, waiting for a car which could be sent to (or through) Toledo. The shipping point is about 150 miles south of Toledo and 210 miles from Detroit. Finally the consignee was gladdened by a telegram saying that his freight would be sent forward the next day, in a car of the Chicago & Vancouver—that is to say, in a car which, according to the rules, could be sent to Chicago, but which could not be sent to Toledo or Detroit. The shipper had concluded to end the intolerable delay by shipping the freight to Chicago and then, by the time it reached that city, to order it reconsigned to Detroit; but in doing this, he was obliged, it appears, to order the goods shipped back, by the same road which had carried it forward; therefore it came back to Toledo, not by a direct line, as indicated in the sketch, nor by the more direct main line of the Michigan Central, but by a roundabout route, nearly as long as the line from the starting point to Chicago. At last accounts the goods were on the way to Toledo. If they finally reached that point; and if they were transferred to the road leading from Toledo to Detroit, they may reasonably be expected eventually to arrive at the door of their owner. The whole journey of this shipment appears to have been some 800 or 900 miles long, or about four times the normal distance from shipping point to destination.

J. E. M.

MORE YARD LIMIT BOARDS

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The installation of yard limit boards requires switch engines and other trains using the main track to protect only against first class trains and necessitates other trains running between yard limits under control, expecting to find the main track occupied. Some roads require trains carrying passengers, including local way-freights, to protect the rear end at all times. On branch lines there is generally a scarcity of yard limit boards while on some of these lines the local work and the switching is as heavy as on main lines. It would seem advisable particularly in such places to put out a few more yard limit boards to save the cost of a man flagging at most of these stations, the cost of these boards being small compared with that of a flagman.

In this connection it may be said that where trains are few in number enginemen do not regard yard limit boards as they should. However, if trainmasters insist on proper flagging by brakemen they should insist equally on engineers obeying yard limit boards. There is as much logic in the one as in the other.

There exists a practice among some conductors of endeavoring to have the despatcher do a part of their flagging for them by asking him for information regarding following trains when at stations not protected by yard limit boards and relying on this information. This is dangerous. On some lines it is understood that the despatchers are required to protect trains on branch lines by train orders to allow the entire crew to do its local work at a station without sending out a flagman. This is doubly dangerous for several reasons. In the first place it establishes a bad precedent, which will spread to other parts of the division sooner or later. It removes the very essence of the flagging rule by transferring the responsibility to a man perhaps 100 miles away. If a crew works under conditions where the men do not have to flag properly for some time and it is then transferred to a more busy part of the line the old habit of neglecting to flag will remain for a time and a serious collision may result. If the rules require flagging there is only one thing to do and that is to flag in the proper way.

J. L. COSS.

ENGINEERS' RICHEST ENGLISH UNION.—The treasury balance of the British Society of Locomotive Engineers, the richest of the big English trade unions, amounts to about $32 per member.

Carriers Present Evidence in Rate Case

Testimony of Railway Executives Regarding Increases in Expenses and Necessity for Improving Credit Conditions

HEARINGS before the Interstate Commerce Commission on the application of the railroads of the country for authority to make a general advance in freight rates of 15 per cent, with the exception of a few commodity rates on which specific advances are asked, and some rates which cannot be advanced because of existing differentials or other relationships, were begun before the Interstate Commerce Commission at Washington on Monday, May 7. The commission set aside the week for the hearings and the time was divided between the eastern, southern and western carriers. The eastern roads began the hearing and by night had completed the presentation of their case in chief. They were followed on Tuesday by the southern lines.

The presentation of the case for the eastern lines was handled with unusual expedition, being interrupted by only a few questions by the commissioners. George Stuart Patterson, general solicitor of the Pennsylvania, made an opening statement on behalf of these roads. Exhibits containing the general statistical showing for the combined eastern roads, which had been compiled by the Bureau of Railway Economics from information furnished by the roads, were filed by Julius H. Parmelee, statistician of the bureau, without any testimony on the subject. George H. Randolph, commissioner for the lines in Official Classification Territory, filed a statement describing the application of the advances and the methods by which it is proposed to maintain existing differentials. Statements describing the situation as to the principal individual lines were then read to the commission by Samuel Rea, president of the Pennsylvania Railroad; A. H. Smith, president of the New York Central; L. F. Loree, president of the Delaware & Hudson; Howard Elliott, chairman of the New York, New Haven & Hartford; F. D. Underwood, president of the Erie; A. W. Thompson, vice-president of the Baltimore & Ohio; J. H. Hustis, receiver of the Boston & Maine, and George S. Hobbs, vice-president of the Maine Central.

A large number of representatives of shippers and state railway commissioners were on hand, but took no part in the proceedings because the commission had suggested that the full presentation of the carriers' side would be facilitated if they were allowed to put in their case without interruption, and that cross examination of their witnesses be deferred until the subsequent hearings. The railway witnesses will be recalled when the hearing is resumed on May 23 for cross-examination after the representatives of shippers have had an opportunity to examine the testimony and exhibits introduced. The shippers will then present their case.

That the proposed 15 per cent advance would not cover the great rise in the cost of operating necessities was indicated in the estimates presented for the eastern roads, 60,000 miles of line carrying about half the entire traffic of the country. While the advance would add $142,000,000 to the eastern revenues, the indicated increase in expenses for coal, labor and materials, and not including locomotives and cars, was $217,000,000.

High Cost of Railroad Operation

The high cost of railroad operation was summarized in the following comparative figures of the operating expenses of 1916 and the indicated expenses for 1917, submitted by the Bureau of Railway Economics:

	1916 Expenses.	Indicated 1917 Expenses.	Increase for 1917.
Coal	$104,000,000	$162,000,000	$58,000,000
Wages	701,000,000	770,000,000	69,000,000
Materials	210,000,000	300,000,000	90,000,000
Totals	$1,015,000,000	$1,232,000,000	$217,000,000

The eastern roads have been forced in recent months to pay war prices in competition with industrial plants to supply coal for their daily needs. The New England roads have been especially hard hit. With a total consumption of 62,000,000 tons on the eastern lines, and an average advance of 94 cents a ton, these carriers must take an additional $58,000,000 out of their earnings this year to meet their fuel expense. Their coal bill last year was $104,000,000; this year it will be $162,000,000.

Wages, the commission was informed, are being advanced through all ranks to meet the general rise in wages in neighboring industries. Only by such advances had the roads been able to prevent large numbers of their employees from going to more prosperous industries bidding for labor. The increased wages granted trainmen under the Adamson eight-hour act add $36,000,000 to the eastern payroll, while advances to other employees amount to $33,000,000 more, a total increase of $69,000,000, or an average of nearly 10 per cent, over the $700,000,000 eastern payroll of 1916.

G. S. Patterson

Railroad materials of all kinds have advanced in price by leaps and bounds—the average running above 40 per cent. Materials paid for out of earnings amounted to $210,000,000 last year. At current market prices they would cost $300,000,000. If the eastern roads continued to purchase these necessities in the same volume as heretofore, to maintain their properties in a condition fit to perform their public service, the great advance in the market for supplies would add about $90,000,000 to operating expenses. These determinable additions to operating expenses aggregate about $40,000,000 in excess of the entire surplus above dividends earned by the eastern carriers in 1916, the year of record income.

In addition to these definitely determinable increases in expenses, the carriers cited the unprecedented advances in the market prices for locomotives and cars, running as high as 50 to 100 per cent. Locomotives purchased for $33,000 in 1914, and $46,000 in 1916, it was stated were now costing $55,000; freight cars that sold for $825 in 1914, and $1,675 in 1916, had advanced to $1,800. It is imperative, that many millions of dollars be spent on equipment to provide for the traffic requirements of the eastern territory.

Despite the fact that 1916 earnings were the largest in the history of the railroads, it was pointed out that the net income on the $6,800,000,000 invested in the eastern roads was but 6.53 per cent, and that the average income on property investment for the past four years was only 5 per cent. The rate of income, it was shown by detailed financial exhibits presented to the commission, had been steadily declining for some years, due to the fact that, while rates for service had remained practically stationary, the cost of producing transportation had steadily risen. The average rate per ton per mile for the past 14 years was less than two-

thirds of a cent (6.3 mills), and in 1916 the average rate was 6.27 mills.

Increased Efficiency of Operation

To show the increased efficiency of operation, records covering a period of 14 years (1903-1916) were presented. The average tractive power of locomotives had been increased 50 per cent, the average capacity of freight cars 40 per cent, and the average freight train load 72 per cent. Freight traffic in the eastern territory increased in these 14 years two and a half times as fast as the population, although the miles of line increased only one-third as fast as the population. By intensive development of existing railroad systems, it was pointed out, the carriers had been able in a measure to keep pace with the demand for transportation, but the diminishing return on the investment had contracted the flow of new capital into the industry, and seriously checked railroad expansion.

Current reports of the carriers to the commission, Mr. Patterson pointed out, were already showing the effect of higher operating costs on net revenues. Comparing the calendar year 1916 with the fiscal year ending June 30, 1916, there had been an increase in gross revenues of $85,000,000, but all of this gain and a million more had been lost because of higher operating costs.

For the eight months since June 30, 1916, Mr. Patterson contrasted an increase in gross earnings of $91,000,000 with a loss in net earnings of $26,000,000, or 8.86 per cent. For the nine months to April 1, reports of the Pennsylvania, New York Central and Baltimore & Ohio, which the commission took in the 1910 and 1913 rate cases as typical of the eastern situation, showed a loss of $19,000,000, or 10.78 per cent, despite an increase in gross of $63,000,000, or 9.97 per cent.

Abstracts of the statements by eastern executives follow:

SAMUEL REA

"The conditions surrounding the railroads at the present time involve a direct and immediate menace to the country at large, and also to the shippers, passengers and owners of the properties, because of inadequate facilities and insufficient credit," said Samuel Rea, president of the Pennsylvania Railroad. If they are adequately to handle existing traffic and be prepared to meet the necessities of the international situation, it is absolutely essential that the railroads be granted higher rates.

If the entire advance in rates that the railroads ask should be granted, the Pennsylvania System would be $12,000,000 worse off in 1917 than in 1916, Mr. Rea said. He estimated that the entire rate advance would amount to only 13.31 per cent of the freight revenues (because less than 15 per cent would be derived from the specific increases asked on coal, coke and ore) or a total of $39,578,000, whereas a conservative estimate showed that expenses of the Pennsylvania system would be increased by $51,892,000, as follows:

Fuel	$15,099,000
Increased material prices (specific items only)	14,694,000
Wages—Adamson Law	10,757,000
Wages—adjustment for employees other than trainmen	10,842,000
Taxes (Federal Capital Stock Tax only)	500,000
	$51,892,000

Practically no very substantial portion of these increases, Mr. Rea said, became effective until after January 1, 1917. The figures for the calendar year 1916 show that for that year the Pennsylvania Railroad System, after sinking fund payments of $6,457,571 and average dividends of 6.26 per cent, had remaining a surplus of $36,700,000 or 2.90 per cent on the total capital obligations in the hands of the public. The minimum increases in these five expense items alone of $51,892,000 would not only wipe out the entire surplus, but cut into the sinking fund payments and dividends to the extent of $15,200,000.

During the last seven months (September, 1916, to March, 1917, inclusive) even with an increase of $17,500,000 in total operating revenues, the large increase in operating expenses and taxes has not only more than absorbed the increase in revenues, but has actually caused a decrease in net operating income of $12,400,000, or 22 per cent, as compared with the corresponding period of the previous year. The year ended June 30, 1916, was the first really good year that the Pennsylvania system has had since 1910. In every year between these two the return on property investment has been less than for any year in the period between 1900 and 1910. The returns on property investment from 1900 to 1910 averaged 7.20 per cent, from 1911 to 1916 they averaged 5.40 per cent, and from 1913 up to and including 1916 the average was but 5.30 per cent. For the years 1914, 1915 and 1916 the average return was 5.24 per cent, and for 1915 and 1916 was but 5.61 per cent.

Samuel Rea

The favorable tendencies of the year ended June 30, 1916, continued to exist through July and August of that year. Since that time, however, a significant change has taken place. In the nine months since June 30 (which include the favorable months of July and August above referred to), with an increase of $29,637,000 in total operating revenues, which increase occurred in every month except February, there has been a decrease in net operating income of $9,716,000, caused largely by an increase of $21,400,000 in transportation expenses. Payments for increased wages under the Adamson law, and the increased wages to other classes of employees, both of which have been in force since January 1, are only included for three months in this period.

In other words, the road is in even a worse situation than in 1913, when for a number of years there had been a continuous increase in operating revenues, but on account of the increased property investment to provide more facilities and equipment, there was a steady decrease in the return in property investment. In 1917 it has substantially increasing operating revenues, but the operating costs have ceased to be inelastic in that they have expanded substantially upward and have much more than absorbed the additional revenues received.

Since June 30, 1916, there has been a substantial percentage increase in the number of tons and passengers handled per car and per train, which ought to have meant an increase in net operating income. However, the saving that should have been effected thereby was nullified by the increased prices of materials, increased wages, the expense incident to congestion (which became so acute during the last quarter of 1916), and the reduced efficiency of labor owing to the inability of the railroads to retain their employees in competition with industrial concerns.

It would seem to be to the interest of the shipper, Mr. Rea continued, to bear an increase in rates in order that he might be taken better care of in time of industrial activity by the roads being in a position to provide for these maximum demands.

I feel, therefore, he concluded, that the increased rates asked for are absolutely necessary from the standpoint of the railroads and country, entirely aside and apart from the

present international crisis, although, of course, this latter situation intensifies the need for keeping the railroads in a stable and prosperous condition, both physically and financially. I feel that it is absolutely essential to the welfare of this country and to the business we serve, that the Pennsylvania system as well as other railroads be promptly put in a position where they can continuously provide and maintain an adequate transportation service."

Supplementing his formal statement, Mr. Rea replied to the suggestion made to the railroads by the commission, that carriers should indicate the extent to which they are willing to limit the rate of dividends to be paid during the continuation of the war.

Mr. Rea said: "It would be impossible and unwise to suggest any dividend limitations during the war without any knowledge of the extent of the war or of the increased cost of capital, labor, materials or taxes.

"It is impossible to state what may or may not be fair dividends under war conditions. The course of events must decide that question, but certain it is that the present application for increased rates was not made with any desire for increased dividends and does not bear any relation thereto."

Stating that the Pennsylvania System paid only moderate dividends, Mr. Rea continued:

"No reduction can be made below 6 per cent without weakening the credit of the company and increasing the cost of raising new capital. Its financial condition must be kept strong and the stock and security holders should not be discouraged."

In reply to the commission's questions as to whether an emergency in the affairs of the carriers exists, whether all carriers require the same relief and why the relief should take the form of a flat increase of 15 per cent in freight rates, Mr. Rea said:

"An emergency exists, not temporarily but continuing, which affects transportation in such a way as to require prompt relief through increased net earnings.

"The same relief is necessary for all, because it is a minimum relief, as illustrated by the Pennsylvania System when I show that the increased rates will not offset our increased expenses and taxes. But roads which derive the greater portion of their revenues from passenger traffic will require special consideration because the freight rate increase will not be adequate.

"The percentage method was adopted as affording the most equitable and equal distribution of the increased expenses which are general in character and affect all traffic and was the only method by which increases could be secured in a reasonable time.

"The percentage was made 15 per cent because the figures before the carriers as to increased cost indicated that while a greater percentage might be needed that was the lowest amount to cover the necessities of the situation. It develops, however, citing the case of the Pennsylvania System alone, that the increased expenses will be considerably above those originally estimated, as I have previously indicated."

A. H. SMITH

Declaring that the heavy advances in the cost of coal, labor and materials would add $45,000,000 to the company's operating expenses this year, A. H. Smith, president of the New York Central Lines, told the commission that the condition of the roads represents "an acute attack of the trouble that has been with us for many years. Undoubtedly a different level of prices is now upon us," he said. The railroad must pay rising prices for what is used, and it can with the greatest difficulty raise its own rates to offset those. By such a process equity in the property is slowly but surely extinguished, and if it is continued the finest transportation machine will eventually be broken down. Mr. Smith stated that the New York Central had recently been unable to provide for its capital needs by the sale of new stock. For improvements considered essential for the efficient handling of traffic under normal conditions of peace, the system would have to spend $150,000,000, and urgent capital expenditures that must be made this year aggregate $38,400,000. In discussing this phase of the problem, Mr. Smith said:

Funds, other than those required for maintenance and operation, must be provided for the upbuilding of the property to enable it to render proper service and keep pace with the growth of the territory that it serves. It is necessary that the company be permitted to maintain its earnings at a level that will make its securities attractive to investors and thus permit it to obtain the new capital required for investment in the property, and at the same time earn a margin above interest and reasonable dividends that can be turned back into the property in payment for facilities that are required or demanded by the public, but that are not self-supporting, and that should, therefore, for the future welfare of the company, be paid for from income.

The railroads have pledged themselves during the present war to co-ordinate their operations, merging their individual and competitive activities in an effort to promote the best interests of the country. The execution of the comprehensive plans of the government for raising and training an army will involve considerable additional expenditures not heretofore contemplated for the establishment of adequate railroad facilities at mobilization camps and at terminals and other points to permit the expeditious movement of troops with the least possible interference with the regular traffic of the road.

Maintenance of a higher degree of efficiency will involve increased expenditures on account of the payment of the existing market prices for prompt deliveries of required material, higher wages to employees to retain them in the service, and higher costs of expedited service which it will be necessary to render. The one source of funds available promptly is through additional revenues which can be obtained only through higher rates.

A. H. Smith

The earnings of the New York Central in 1916 were the best in recent years, showing a net return of a little more than 7½ per cent upon the property devoted to public use. In an industrial company at this time 7½ per cent would be considered very small. Merely by contrast with other years in the recent past, we are pleased with it, and if we could accept it as indicating a changed condition which might be held, we should be more pleased, but already the temporary gain has disappeared. Our stockholders received no greater dividend, and the larger surplus was but a slight offset to the two very poor years which preceded, when the system earned but 3.29 per cent in 1914 and 4.41 per cent in 1915. The average of the three years would give a return of barely 5 per cent, and on such a small return we cannot grow as we should.

Mr. Smith presented the following statement comparing estimated increases in expenses for 1917 with the additional

revenue that would be derived from a full 15 per cent advance in the rates on all commodities, an advance greater than actually proposed:

	N. Y. Central Except B. & A.	N. Y. Central System.
Freight revenues in 1916	$127,866,101	$239,593,538
15 per cent advance on all freight	19,179,000	35,939,030
Increased wages—Adamson law	3,619,000	7,350,000
Other increased wages granted	3,700,000	6,859,000
Increased cost of fuel	6,589,000	13,566,000
Other materials and supplies	9,600,000	18,000,000
Increased taxes	2,306,000	2,996,000
	$25,814,000	$48,671,000

"We do not need to forecast the future to a great extent," concluded Mr. Smith. "It is a present condition that we have to deal with. We are doing a record business—we cannot do much more without increasing our plant and equipment—and yet our net income is too small to justify us in increasing the plant, if indeed it is not too small this year to pay our obligations. We do not ask to shift our burdens to others; we ask merely to share in the prosperity of the country and to maintain our position in relation to those we serve."

L. F. LOREE

L. F. Loree, president of the Delaware & Hudson Company, devoted himself particularly to the financial emergency confronting the railroads, saying in part:

The financial plight of the railways has emerged within recent months so that it can be seen by all and has now come to be a crisis, demanding action, but in no sense can it be considered as a sudden or unexpected happening. It is in part the consequence of forces which have been operating and gaining steadily in momentum for at least three decades, while it is also in part the consequence of huge and unprecedented forces that began to be brought into action in the early part of 1914.

I submit for the consideration of the commission two charts cut from the New York Times Annalist of Monday, April 16, 1917. If we take the curve of the cost of living, being the fluctuations in the average wholesale prices of 25 food commodities selected and arranged to represent a theoretical family's food budget, and consider this as one of a number of significant tests, it will be seen that there began to come forth into view in November, 1915, a significant rise in cost which has been steadily moving onward with increasing pitch to the present time and the end of which is not yet indicated. Moreover, the emergency is now a crisis, an occasion for action, for it is plainly apparent that without relief the situation will increase in difficulties until the plight of the railways becomes the plight of all dependent upon transportation; i. e., of the whole economic complex.

L. F. Loree

If, now, we consider the other chart from the Annalist, the movement of stock market averages, it will be seen that the rise in the closing average prices of both the railroads and industrials began toward the end of March, 1915, or about seven months before the beginning of the rise in the cost of living. It is frequently said of the exchanges that one of their chief functions is to discount the future and that their records of today forecast conditions six months hence. If this chart is significant, it indicates in the present downward tendency of security values that the exchanges felt as long ago as last November that there was a failure on the part of those in authority to recognize the coming crisis, and if we consider their action of the past few weeks they forecast a veritable debacle unless intelligent, vigorous and decisive action is had at once.

Referring to the history of American railroads, Mr. Loree said that the responsibility for the present condition did not rest upon the officers responsible for their operation. Whether we consider the capital involved per mile of line open, cost of the movement per passenger or per ton of freight carried, or the declining ratio of the amount of capital involved to the unit of service rendered, their history is the envy of the world.

We must, therefore, look for other explanations. There are many who consider money solely as a standard of value and for that purpose as having a fixed and unfluctuating value. If we take that view, it is apparent that railway service constitutes about the only commodity or service which has not in the past two years risen as compared with the standard. If this be the case, it is apparent that there is necessity for a general and immediate adjustment or increase in the rates charged for railroad service, or otherwise the railroads will be unable to secure, out of their revenues, the labor and materials necessary for their operation, to meet their fixed charges and dividend requirements, and to pay interest sufficient to attract the additional capital which is necessary for their operation, maintenance and development.

There are others who consider money rather in its function as a medium of exchange. If we take that view, it is apparent that in the past two years there has been a diminution in the value of money, and that with the little-varying schedules of rates and the largely-increasing rise of wages and prices of materials and supplies and of the rental value of money, a fixed quantity of railway transportation is, from year to year and especially during the past two years, exchanged for a steadily decreasing quantity of railway labor and railway materials and supplies, as well as money rental. If this be the case, it is apparent that the railroads are not now asking for real advances in rates but merely for readjustments (readjustments that I think will be inadequate) sufficient to make up a part of the losses which they have sustained by reason of general rises in the wages level and the prices level.

So far from keeping pace with rising costs which have been in progress since 1896, the railroads have been required to reduce rates which had not been changed since the value of money was at its highest. He cited the reduction of anthracite rates in 1916 as a case in point.

Speaking particularly of the situation of the anthracite carrying roads, Mr. Loree said: "An increase in the anthracite rates, and an immediate increase, is of extreme importance not only for the seven so-called anthracite roads, a substantial part of whose earnings are derived from anthracite traffic, but also from the view of the market relations between anthracite and other fuels which are competitive or which may be substituted."

HOWARD ELLIOTT

A 15 per cent increase in freight rates would not pay the increase in the coal bill of the New York, New Haven & Hartford this year, to say nothing of other increases in expenses, Howard Elliott, chairman of the New Haven, testified. If the 15 per cent could be applied on all of the freight business of the road, he said, the increase in revenue based on the 1916 business would be about $6,500,000, but the rates on some traffic cannot be advanced and the greatest increase in revenue the road could expect would be only $3,000,000 to $3,500,000, while contracts that have been

placed for 1917 indicate that the fuel bill alone will be approximately $6,000,000 greater than last year.

The New Haven asks for a substantial increase in rates. Mr. Elliott said, because it is facing in common with all roads increasing costs of all kinds, which are cumulative and which will in a short time mean an annual increase in its expenses of from $12,000,000 to $17,000,000. For the last three years the balance after paying expenses, taxes and fixed charges has been, for the year 1914, $182,960, for 1915 $4,659,130 and for 1916 $5,554,977. On the book value of the property of $226,603,000 the return in the admittedly prosperous year 1916 was only 5.4 per cent. Because of the lack of facilities it is unlikely that the volume of business done will be materially larger and the increased expenses are more likely to eat up all balance above fixed charges. Mr. Elliott gave the following estimates of increased expenses for 1917 over 1916:

	Minimum.	Maximum.
Adamson law	$1,400,000	$1,600,000
Other wages	2,100,000	2,500,000
Fuel	4,000,000	6,000,000
Other material	4,000,000	6,000,000
Increased interest	500,000	500,000
Increased taxes	300,000	400,000
	$12,300,000	$17,000,000

In enumerating other reasons why the New Haven needs higher rates Mr. Elliott said:

The general level of rates on the New Haven is lower than for a majority of the roads in the country. It, in common with other New England roads, has to pay more for fuel coal than other roads in trunk line territory, because of the freight rates,—by rail and water. The general level of wages in its territory is higher than in most of the trunk line territory. It needs to spend many millions of dollars in betterments and improvements in the interest of adequate service to the public and better working conditions for the employees. Its net returns should be larger so as to increase the amount to be spent upon the property, and so as to improve its credit so that money can be obtained on more reasonable terms than under present conditions.

Howard Elliott

While the year 1916 showed a very large volume of gross earnings for these rail properties, — $85,640,365, the largest in the history of the company,— the difficulties of doing business were very great, due to congestion, disturbed labor conditions and industrial complications due to the European war, which bid fair to be far worse during the next 18 months than anything experienced before. During the latter part of 1916, substantial increases in gross operating revenue were entirely absorbed by the rising expenses.

It is impossible to estimate accurately the cost of future fuel supply because a contract for coal does not insure the delivery except upon a falling market. In the last three months of 1916 the company was compelled to buy over 100,000 tons of "spot coal" at prices which averaged $7.35 per gross ton, as compared with a contract cost of $2.24 per ton, an increase of nearly 127 per cent, in order to keep the road in operation, because coal under contract was not delivered. It is obvious that the roads must work as fast and as hard as they can to get themselves in a position to do promptly a maximum amount of business so as to help win the war. This may mean, and doubtless will mean, a change in the currents of industry to a greater or less extent, which will have an effect on gross earnings.

F. D. UNDERWOOD

F. D. Underwood, president of the Erie, said that his company had received no protests from shippers on its lines that freight rates were too high, but that it had received "countless protests" against the insufficiency of facilities for the movement of freight. The company is being called upon to defend damage suits, Mr. Underwood said, "by reason of its inability to give efficient service from causes beyond its control."

Since 1901, said Mr. Underwood, the Erie Railroad has expended in excess of $119,000,000 in improving the physical property of the company, while during the same period the net debt in the hands of the public has increased $66,890,000 which is 56 per cent of the amount expended for capital improvements. The balance of the funds expended in improvements were derived from the company's surplus income, substantially all of which for 10 years past has been expended for additions and improvements to the property and the purchase of equipment. No dividends have been paid in the last 10 years. Additional main tracks and sidings have been laid. Notwithstanding these considerable expenditures in the way of grade reductions, additional tracks and equipment, it is unable to move its freight traffic promptly .This failure entails a loss on the community and on the railroad alike. Its operation under present and past conditions develops the fact that the present rate per ton mile is inadequate to nourish it, to keep it in the condition required in the interest of public safety and commercial health.

F. D. Underwood

Referring to the rapid increase in the cost of material and supplies Mr. Underwood quoted figures to show that the cost of six principal commodities used by the railroads had advanced during the year by percentages varying from 5.3 per cent for ties to 75 per cent for steel castings, and averaging over 40 per cent.

Due to higher wages for trainmen imposed by the Adamson law and to advances to employees of other grades the wage bill of the Erie this year will be increased 6.76 per cent, adding $3,850,000 to operating expenses.

These established increases in operating costs," he continued, together with estimated increases in taxes for the current year indicate a total increase in expenses and taxes for 1917 equivalent to 15.84 per cent of the total operating revenues for the year 1916, during which year the company hauled the heaviest traffic in its history. Its credit should be revitalized in order that it may create through car trust obligations a fund sufficient to purchase new equipment, both locomotives and cars. Its terminals at New York, Youngstown and Cleveland require an expenditure in order to enable it to do its business in ordinary times, of not less than $50,000,000. To float the bonds to accomplish this requires a better credit, which can only be had by showing a better margin between gross and net income. It has, therefore, to petition for an increase in all the commodities

transported by it, not that it may carry a profit to its shareholders to which they are fairly entitled, but that it may preserve its corporate life and properly discharge its duties to the general government as a whole and to the local communities and populations it serves.

A. W. THOMPSON

The Baltimore & Ohio will have a very serious and difficult problem to meet, even should the full advance of 15 per cent in freight rates be granted, said A. W. Thompson, vice-president of the company. Estimating that rate advances already granted, together with a 15 per cent advance on all state and interstate business, would, at the most, yield but $12,800,000 additional revenue, Mr. Thompson pointed out that a conservative estimate of the increased cost of labor, materials and taxes would add $16,600,000 to expenses.

A. W. Thompson

The gross earnings in the calendar year 1916 were $116,968,882, the greatest in the history of the company, and the net operating income was $26,508,869, giving a return on property investment of 4.74 per cent, compared with a 4.85 per cent average for 12 years.

In that year of greatest traffic the income on capital obligations was 4.92 per cent, sufficient to provide for interest and dividends (the rate of dividend on the common stock having been reduced from 6 to 5 per cent in 1914), but leaving a surplus of only $2,611,608, or a margin of safety of less than one-half of one per cent on total capital obligations.

That the company would not be able under the burden of present operating costs to continue to pay even its reduced dividend, unless it curtailed expenditures for materials and labor, was the opinion of the president, Daniel Willard, quoted by Mr. Thompson as most conservative in view of the fact that in the prosperous year 1916 the surplus for the common stock was $10,100,000, while increased costs this year were estimated at $16,600,000. He presented these figures of estimated increases in expenses this year:

Coal	$3,169,000
Wages	4,930,000
Materials	7,996,000
Taxes	500,000
Total	$16,595,000

Mr. Thompson spoke of the necessity for continued capital expenditures at the same rate as in the past. He said:

For the past 10 years the Baltimore & Ohio has been spending for betterments, including equipment, an average of $18,000,000 per year. Even this expenditure has not been large enough to keep up with the development of the business and during the past year lack of terminal facilities, equipment, and certain needed improvements along the line of road, has been very keenly felt. At the present time it has on its program improvements which it is felt should be completed within the next two years, and which amount to about $54,000,000, of which $16,000,000 are for cars and locomotives. These figures have been based on an estimate prepared last year, and are on the basis of the present year's prices of materials. The program covers needed improvements for all departments.

The question of railway transportation in connection with any general national preparedness is vital, and while no one can foresee what may be demanded of the railroads in this present situation, it is important to consider in advance such requirements, and be prepared to perform any service that might be demanded of the railroads because of the national necessities. While this matter of preparedness is brought to the attention of the commission as having an important bearing—the necessity of the railroads for an increase in freight rates is entirely aside from that question. Regardless of the outcome of the present rate case the railroads are going ahead in an effort to put themselves in shape to meet the calls which may be made upon them. The principal problem before the railroads is how they may meet the demands to handle a constantly growing commerce of the country.

J. H. HUSTIS

An increase of 15 per cent in freight rates, even if traffic continues to move in the record volume reached during 1916, will fail by $3,150,000 to meet the increase in operating expenses caused by the advance in the cost of labor, fuel and materials, J. H. Hustis, receiver of the Boston & Maine, told the commission.

In the four items of wages, fuel, other materials and car hire, Mr. Hustis explained, the increases during recent months will add $7,750,000 to the operating expenses of the Boston & Maine during the current year. These items he estimated as follows:

Increase in wages due to Adamson law, and other increases ready granted or pending	$2,500,000
Increased cost of fuel	3,150,000
Increased cost of other materials	1,500,000
Increase in rate, 45c. to 75c. per day, for freight car hire (six months only)	600,000
	$7,750,000

Mr. Hustis said that the Boston & Maine is now paying $3.15 per ton upward for coal as against an average of $1.25 per ton under former contracts, while the water freight for moving the coal has advanced from 60 and 80 cents a ton to $3.00 a ton.

The increase in the expenses as estimated, therefore, will exceed the estimated revenues by $3,150,000 a year at the present time. For the calendar year 1916 the balance after payment of fixed charges, with no dividends, amounted to less than $4,800,000, which was the largest balance in the history of the road.

J. H. Hustis

From this it is evident, he said, that the Boston & Maine not only needs the proposed increase of 15 per cent in freight rates now under discussion, but considerably more if its credit is to be restored, and it expects to apply to the commission in the immediate future for further changes to meet its particular requirements. But it has felt that this application for a horizontal increase of 15 per cent lies at the threshold of the case, ought to have precedence, and should not be complicated by the peculiar situation of the New England roads.

The efficiency of the Boston & Maine system is essential to the prosperity of that portion of the New England states through which it passes. It is also essential to the proper protection of the coast and of the population in time of war.

The system can only be made efficient by the expenditure of large sums of money, and these sums can only be obtained by making good the credit of the system.

If the dictates of public opinion are to be followed; if the population and property of New England are to be protected from a foreign enemy in time of war; if the manufacturer, shipper and consumer of New England and of the United States are to be furnished with proper facilities, this increase now sought for is an absolute necessity.

GEORGE S. HOBBS

George S. Hobbs, vice-president of the Maine Central, emphasized the strategic importance of his line and the necessity of enabling it to maintain its service at the highest degree of efficiency in view of the existing national emergency.

G. S. Hobbs

The Maine Central serves the Atlantic coast east of Portland for over 300 miles to the Canadian frontier. In this territory it reaches several important shipbuilding cities and towns where, during the war, it will be important that the freest possible access for supplies and munitions shall be maintained.

It operates as an international highway between New York, Boston and other New England territory, and the Canadian maritime provinces, including the ports of St. John and Halifax. During the winter months its main terminus, Portland, is the nearest seaport to Montreal. There are two main lines between Montreal and Portland, the Grand Trunk being one and the Maine Central, in connection with the Canadian Pacific, the other. It is important that these be maintained at the highest war efficiency for the use of our allies.

Just what additional burdens will be imposed upon these roads by the war, it is impossible definitely to foresee, he said, but it is of the utmost importance that efficiency be maintained at the highest possible point, in order to provide for the transportation of troops and supplies over this road according to such requirements as may be made, and also in order to take care of possible sick and wounded who may be returning from the European war zones to their homes in the United States or Canada by way of the ports of Halifax and St. John.

Mr. Hobbs explained that since November, 1916, the operating expenses of his road had increased so much more rapidly than operating revenues that it had produced a decrease in operating income which had continued down to the month of March of the present year.

Southern Railways Give Evidence

Executive officers of the southern railways presented their evidence on Tuesday, giving figures similar to those presented by the eastern roads on Monday to show that an increase is necessary to offset rapidly rising costs of operation and to keep them in a condition that will enable them to do their part in serving the country.

L. E. JOHNSON

A 15 per cent advance would not fully offset the higher wages and prices for fuel and materials, L. E. Johnson, chairman of the Norfolk & Western, told the commission. In reply to the commission's request that the carriers indicate the extent to which the roads are willing to limit dividends during the war he said:

"The Norfolk & Western Railway Company's management feels that during the war its dividends on common stock should not exceed the present regular dividend rate, but in order to justify dividends at this rate there must be an additional amount of net income from which to meet expenditures for additions and betterments to road and equipment which are required to maintain (without increasing) the company's earning power and capacity."

While the southern lines will be less affected by the Adamson law than the eastern and western roads, Mr. Johnson estimated the increased expense for his road for 1917 as $7,947,647. Of this $3,039,250 represents increased wages, $2,940,000 the increased cost of coal and $1,968,397 the increase in the cost of other materials and supplies. The increase in earnings which would result from the higher rates asked he estimated at $5,588,891 and on the basis of last year's earnings the net revenue would be decreased by $3,458,543 on account of the higher operating expenses.

An emergency exists which affects transportation in such a way as to require emergency relief through increased net earnings, he said. It affects all carriers alike and, so far as can be determined, in the same degrees and requires the same relief as to each, and the relief should take the form of a percentage increase in all freight rates, other than that allowed on coal, ore and coke, and others as specified in the applications now on file. That percentage of increase should be at least 15 per cent.

It is not claimed that this emergency existed prior to January 1, 1917, but the emergency did arise as soon as the President of the United States declared armed neutrality against Germany and its allies. It became an emergency requiring emergency treatment at that time. As to by what criteria it can be determined later that the emergency is past is a question that will be determined by this commission, as we we have already placed ourselves in the hands of this commission.

L. E. Johnson

It is difficult to state in detail what additional burden the war is expected to impose upon the carriers. We may, however, mention the additional expense of guarding property, special efforts to meet the requirements of the government and shippers, special movement of commodities, troops and munitions, special train service and special terminal and yard service.

It is not only essential that sufficient revenue be earned to meet the increased expenses, but there should also be a surplus to enable the carrier to meet its requirements for additions and betterments, and the year 1916 should not be taken as a criterion by which the Norfolk & Western is to meet its obligations to the government and public with additions and betterments, as the percentage on property investment of the Norfolk & Western for the nine years' period ended June 30, 1916, was 5.87 per cent. To meet the growing demands of commerce the total expenditures for road and equipment during the nine years' period ended June 30, 1916, were $87,664,876.

There should be expended in 1917 for roadway and struc-

tures improvements $15,000,000 which does not include any additional equipment.

In reply to the question by the commission as to the purposes to which the increased revenues from the proposed rate advance were to be devoted, Mr. Johnson said there would be no increased revenues, but rather a reduction in net because of the increased expenses.

FAIRFAX HARRISON

Fairfax Harrison, president of the Southern, told the commission that the settlement under the Adamson law had involved the railroads of the South in large additional operating costs in common with all other railroads in the United States. This increment of the expense account had come on top of other and even larger uncontrollable costs which had accrued within recent months. It is as a consequence of these conditions, he said, that the railroads of the South come before the Interstate Commerce Commission to ask approval of a horizontal increase of their freight rates sufficient to increase their revenues in at least the equivalent of what may be found by the commission to be the aggregate of the costs which have accrued for reasons beyond the control of the railroads

Fairfax Harrison

The Southern does not ask an advance in rates merely for the purpose of paying dividends because it does not pay dividends and it has never paid a dividend on its common stock, but it needs an increase in order to maintain and operate its properties to properly take care of the demands of commerce and to keep pace with the growth of the country. If it were not for the extraordinary advance in expenses, estimated at $8,000,000 this year for the Southern Railway, the road would not be asking for advances in rates. It is doing its best now to accomplish the result without having to ask for increased rates, but in view of these new costs which we cannot control and which are imposed upon us I believe it is our duty to ask the commission to allow us to offset those costs from a country that is prosperous and at a time when that country was never so able to bear increased rates, he said.

W. J. HARAHAN

Unless an increase in rates can be had, said W. J. Harahan, president of the Seaboard Air Line, the road will be in the position at the end of this calendar year of having had the heaviest earnings in the history of the railroad, with no net income therefrom, the increased expenses being sufficient to absorb the $1,612,010.62 net income which it had as a result of operation for the last calendar year, and, in addition thereto, the expected $1,700,000 increase in gross earnings, and to attain this result will require rigid economy in the operation of the property. A disastrous flood, such as occurred last summer, or some other unforeseen casualty or cause of expense, might cause a deficit.

He submitted that this proves that an emergency exists requiring relief through increase in net earnings, but he felt that this is really the culmination of a situation which has been developing for a number of years. Up to this time its progress has been insidious, taking place by slow degrees. This condition, however, has brought it to a head. All carriers are affected in a similar manner so far as the burden incident to the sustaining of additional expense is concerned, and as none of them seem to have been enjoying an unreasonable return on their investments, it would seem that they should require similar relief.

It would seem that there can be no question that prices will continue to advance during the war and there is good reason to believe that they will be maintained for several years after the war. The principal items making up the materials used by the railroads consist of coal, iron, cross ties and lumber. These articles were below normal in 1915, not greatly above normal in 1916, but have risen unprecedently in 1917. The average increase in the price of all material used by this company is estimated to be 39.3 per cent for this calendar year, in contradistinction to the 15 per cent increase in rates asked for.

Mr. Harahan continued in part: It seems to me quite clear that the value to a shipper of a transportation service increases as the value of his shipment increases. It is within common knowledge that practically everything that is shipped has, within the past year or more, reached values almost unprecedented. My observation is that the shippers along our line are very much more interested in getting their products to markets than in any question of freight rates. We have had instances of crate material shipped by express. Traffic which has heretofore moved at low water rates now pays the higher all-rail rates. The cry of at least the southern country is for cars and for efficiency of transportation service. The average increase in the values of articles shipped very much exceeds 15 per cent. I do not believe that an increase of 15 per cent in freight rates will prevent the shipment of any traffic which is dependent upon the Seaboard for transportation. On the other hand, I am satisfied that the individual shippers on our line would willingly consent to even a greater increase if they could thereby be assured of sufficient transportation facilities.

W. J. Harahan

Speaking from the most intimate knowledge of the subject, I know that this property is being operated for as little money as it should be under the conditions which surround its operation. To show just how we determine our expenses, I should like to state, somewhat in detail, some of our methods:

First, to determine the amount of money which must be spent in maintenance of way and structures to maintain the railroad in safety and to determine what shall be spent for maintenance of equipment so as to comply with a proper business policy, we make, at the beginning of the year, a very careful calculation by men who are entirely familiar with all the circumstances which govern such determination, including conditions of the roadbed, of traffic, of density of traffic, of equipment, and any condition which might be likely to affect the expenses in question.

So far as maintenance of way and structures is concerned, there is an irreducible minimum below which we cannot go, because in doing so we infringe on safety, which is not allowable under any conditions. There is, however, a maximum amount that can be spent most economically, but which must be determined for each individual railroad. I do not

believe it is true that the larger amount you spend for maintenance the more economical you are, because I believe that a superfluous amount can be spent, producing waste. It is undoubtedly true, however, that the railroad spending an adequate amount must of necessity be able to perform better and more economic service, because of the avoidance of expenses in other departments of operation which may not be avoided unless such adequate amount is spent.

This is also true with reference to maintenance of equipment, because of the apparent fact that locomotives maintained in prime condition are less liable to cause accidents, less likely to cause delays to trains on the road, can pull their tonnage with greater ease and are more apt to produce uninterrupted movement to traffic. This is again reflected in gross earnings when engines and cars are always in condition to be furnished upon the demands of the public so as to take care of the maximum amount of business which can be done with the facilities owned by the railroad.

Therefore, there is a determinate maximum which it is proper to spend.

While transportation department expenses are necessarily bound to fluctuate greater than that of the other departments, with a greater or less amount of business, yet there are many of the expenses of conducting transportation which can also be predetermined in a way so that they may be placed on such a basis that they will fluctuate in a proper ratio with the rise and fall of business.

The other expenses of operation, that is, traffic and general expenses, are also carefully analyzed and planned.

When the determination as to the maximum and minimum amount of money which can be spent are reached, a careful estimate is made as to what the gross revenue will probably be. An allotment is then made to the various departments for their expenses in accordance with the principles above enumerated, that is, that safety must not be transgressed and that there must not be a superfluous amount spent in maintenance. The various departments are then required to keep careful records from week to week as the year goes on to insure that they keep within these expenses. Gross earnings are also watched from week to week and if the earnings increase beyond the prior estimate and if it is felt that more can be spent with economy than the first allotments, additional amounts are allotted. If the gross revenue decreases, then it is necessary to decrease the allotment, but never beyond a point below the irreducible minimum above referred to, because it is necessary to spend at least that minimum for safety. It may be also advisable to increase the charge for maintenance of equipment if conditions warrant or it may be necessary to decrease it if earnings decrease sufficiently so that it may be seen that the entire equipment will not be needed.

This does not end the supervision, however, because we then specialize on the various details of operation of the departments. For instance, we may be able to introduce a labor saving device which will enable us to handle material cheaper than it has been previously handled. We take advantage of that device and either save that amount of money or put it into the property if it is economical to do so.

We check in detail the operation of our stations to determine whether or not freight is being handled as cheaply as it can, and for the purpose of arriving at a proper conclusion as to this fact, we first calculate at what price freight should be handled for and we denominate that as a hundred per cent. We then strive to attain the hundred per cent or as near thereto as possible. The same specialization is made with reference to the cost of handling cars in yards and in case of turning engines.

This railroad keeps a check of the cost of operating every individual freight train on the railroad every day, comparing it with and striving for an attainable 100 per cent.

This method is not confined to our operating accounts, but we also analyze in detail our income accounts, observing the changing tendencies of the various items that go to make up these accounts and make whatever arrangements changing conditions require and whatever economies the situation will allow.

Lincoln Green, vice-president in charge of traffic of the Southern, described briefly the application of the percentage advance in existing rate relationships.

R. V. Taylor, vice-president of the Mobile & Ohio, stated that the increased expenses for his company for 1917 would more than absorb any increase in revenue which the road might receive from the advance asked. To emphasize the fact that the increase in freight rates would not impose a burden on the consumer, he showed that it would amount to only five cents on a barrel of flour from Minneapolis to Mobile.

W. A. Winburn, president of the Central of Georgia, told the commission that he did not know how long it would be proper and necessary to maintain the proposed advances in rates, but it seemed reasonably certain that the wages of labor and the prices of materials and supplies would remain high throughout the war, and perhaps for a considerable period after its close, and the higher rates certainly ought to be continued as long as operating costs were affected as at present by these two important factors.

GEORGE BURY ON THE AMERICAN RAILWAYS IN THE WAR

"I have heard unthinking people say that the railroads of the States might be found wanting. It must be remembered that there is no such vast movement of freight traffic anywhere in the world as on the American continent, and that when the people think as at war, rather than as at peace, and allow the American railways to take the action that is now followed in Europe, the American railways will be equal to any task," said George Bury, vice-president of the Canadian Pacific in an interview given out in New York last Friday. Mr. Bury, who has recently returned from Russia, was on his way back to Montreal after having been at Washington on the request of the advisory committee of the Council of National Defense. Continuing, Mr. Bury also said:

"If the American railways were called upon to move large bodies of troops, and supplied the same accommodation as in Europe, they would be in a position to move a vastly greater number in a shorter time. In Europe during war troops are moved in freight cars when passenger equipment is not available.

"In Europe the passenger service has been curtailed, and the trains left on slowed up, and the running of fast freight trains discontinued. Canada and the United States will have to bend every effort to increase the food surpluses by extra production and saving. Large fleets of ships will have to be built to supply Europe with the necessary food. Troops will have to be raised, and a grave labor shortage will immediately materialize unless means are taken to substitute women for men where work will admit, and of placing the male population in employments of necessity to win the war; cutting off all frills until after the cause of humanity has been saved. The passenger service ought to be reduced and slowed up; the fast freight service replaced with full trains. This will result in an immense saving of fuel, oil and labor. If other reductions, essentials in times of peace, but non-essentials in times of war, such as the closing of outside agencies, taking off freight and passenger canvassers, etc., a number of men would be released for other services. Some of the other belligerent countries, probably through underestimation of the length of the war, or through their eagerness to raise a large army, drew men that could not be spared from essential employments, causing disruption, which made it necessary to return men from the front for transportation, mining and manufacturing.

Some of these nations allowed their cars and locomotives to get out of repair, which has had unfortunate results.

"When history of the war comes to be written it will be found what effect efficient transportation has had on victories, and how inefficient transportation has brought about dire defeats.

"You are to be congratulated in so quickly forming a central committee, in Washington, to deal with the major matters of transportation in the United States as transportation in the United States as a whole, with such an able chairman and executive. If supported by public opinion they can quickly make the drastic moves necessary in this crisis.

"In all the allied and neutral countries food restrictions of varying kinds are in force. Food conservation should be taken in hand here at once. It will not hurt for our diet to be simplified somewhat and we might begin with a darker bread and forbid the consuming now of veal, young lambs, little chickens and baby pigs.

"Once the American peoples are fully informed what the war means, and drastic moves that may be necessary, they will rise as one to put them into force."

Mr. Bury said that war seemed to be one-tenth fighting and nine-tenths business organization; that Americans have the greatest organizers and are the most energetic and resourceful people in the world; that when occasion demanded it, they were capable of the greatest sacrifices and that the world would be surprised at the tremendous effect the entrance of the United States would have.

"But it has taken all the belligerent nations in this world war, who are not directly under invasion, a long time to think as at war rather than at peace. War means great sacrifices and no nation with any spirit could allow all the sacrifices to be made by the soldiers and the soldiers' relatives, but rather every one in the nation must do his part."

AN INCREASE IN FREIGHT RATES OF 3.683 CENTS A WEEK

If the proposed 15 per cent increase in freight rates is allowed the increase in the cost of food consumed by an average family of five people living liberally in a typical city will be just over 3½ cents, says George D. Dixon, vice-president of the Pennsylvania Railroad in charge of traffic, in a statement given out last Saturday. The statement follows:

The ultimate effect of granting the application of the railroads for an increase in freight rates would, undoubtedly, be to lower the cost of living. This may seem like a contradictory assertion, but examination will show that it is perfectly sound. It is a fact that the head of every American family should understand.

The railroads are about to begin what amounts almost to a struggle for existence. They are seeking from the Interstate Commerce Commission authority to advance the charges 15 per cent on freight in general, with the exception of coal, coke and ore. Such an increase upon foodstuffs and the other articles constituting the daily necessities of life would be infinitesimal, while on the other hand it would immensely strengthen the credit of the railroads, and would not only provide them with a basis for obtaining new capital, but also allow them surplus revenues out of which the improvements and extensions could be made, which are so urgently needed to render proper service.

These improvements and extensions would provide the country with such vastly better machinery for the efficient distribution and exchange of its products, that the consumer, when the full effect of it all was felt, could not fail to benefit. In this connection, it is important to remember that the great commercial problem of the day is not production but exchange. High prices in this country are largely due to the fact that we have failed to develop the methods and means of exchange as highly as we have those of production. Concretely, as applying to railroads, this means that they have been stunted by too low freight rates.

Our company has just completed an investigation which ought to interest every householder in the United States. We have figured out what a 15 per cent increase in freight rates would mean in connection with the food supply of an average family of five people, living liberally in a typical city, and obtaining their supplies from a distance.

We have made the surprising discovery that the increase would be just a trifle over 3½ cents a week. Even a very small reduction in the cost of distributing food, resulting from improved railroad facilities, would wipe out that increase many times over. If the railroads had had slightly more liberal rates in recent years, and had been allowed to grow and improve their lines and terminals as they should have done, I do not believe that the food riots, which recently occurred in eastern cities, would ever have happened.

Our investigation into freight rates on food was based on the city of Pittsburgh, which was selected because it is a large interior community, occupying a central location on the Pennsylvania Railroad System, and thoroughly representative of conditions which would be met in our other cities. Here are the facts in detail:

FAMILY OF FIVE PERSONS FOR A WEEK. AT PITTSBURGH.

Food.	Quantities.	15 per cent increase in freight rates would mean.
Meat, from Chicago	20 pounds	8.60 mills
Fish, from Long Island	4 pounds	2.20 mills
Potatoes, from New York State	1¼ pecks (18.75 lbs.)	4.10 mills
Onions, from New York State	¼ peck (3.00 lbs.)	0.66 mills
Cabbages, from New York State	2 heads (4.00 lbs.)	0.88 mills
Canned goods, from Baltimore	7 pints (7.00 lbs.)	1.68 mills
Macaroni, from Philadelphia	1 pound	0.25 mills
Flour, from Minneapolis	25 pounds	7.25 mills
Apples, from New York State	1 peck (15.00 lbs.)	3.30 mills
Bananas, from Philadelphia	2 dozen (7.00 lbs.)	3.08 mills
Coffee, from New York City	2 pounds	0.56 mills
Sugar, from Philadelphia	6 pounds	1.32 mills
Butter, from New York State	3 pounds	1.47 mills
Eggs, from Centre Co., Pa	2 dozen (3.00 lbs.)	1.48 mills
	Total	36.83 mills or 3.683 cents per week.

The rates used in the above tabulation are those on which the commodities actually travel from points of production to the consuming center.

I trust this will show that the rate advance for which the railroads have asked could not justly be made a pretext for an exhorbitant raising of retail prices. It would, however, give the railroads means for vastly increasing their usefulness to the public and, as I have stated, would without question tend to a general lowering of the prices, because distribution and exchange would be more efficient. It would act as a tonic for the business of the country.

LOCOMOTIVE FUEL TEST IN SWEDEN.—Some tests were recently made on the Swedish State Railways with peat powder as a fuel for locomotives in comparison with British coal, in which it was shown that greater efficiency can be obtained by the use of powdered peat. The peat had a heat value of 7,740 B.t.u.'s and the British coal of 12,600 B.t.u.'s, and it was found that 1.45 lb. of peat powder will produce the same quantity of steam as 1 lb. of the British coal. The peat powder was blown through a nozzle into the firebox by compressed air from a steam blower. The firebox was subdivided into an ignition chamber, two side passages and an upper chamber through which the products of combustion are led to and fro before they enter the tubes. Under the nozzle, through which the peat is blown, a small grate carrying a coal fire is provided for igniting the peat. The consumption of the coal for this purpose averages 3 to 4 per cent of the weight of the peat powder used. Firebox temperatures of 3,040 deg. F. were obtained with peat powder and 2,750 deg. F. with British coal. A greater degree of superheat was obtained with the peat powder and the smoke box temperatures were generally less.—*Railway Gazette, London.*

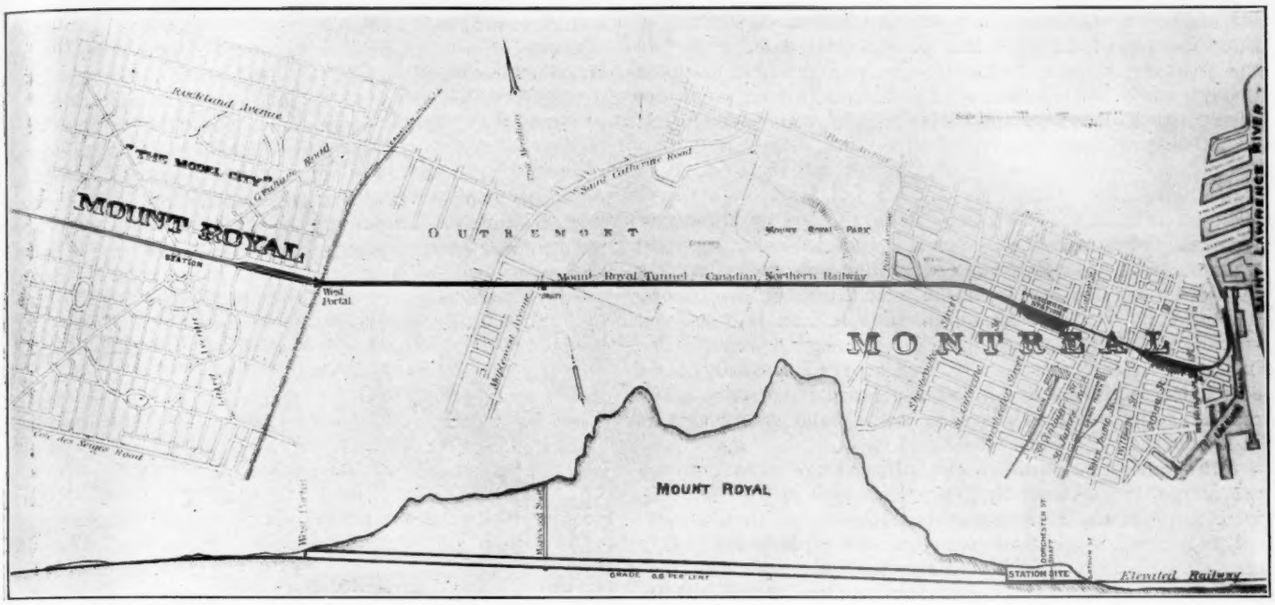


Fig. 1—Map Showing the Electrified Tunnel Between Montreal and Mount Royal

Canadian Northern Electrification at Montreal

An Electrically Operated 3.3-Mile Tunnel Makes Possible Eastern Terminal for Latest Transcontinental Line

By W. C. Lancaster,
Electrical Engineer, Mount Royal Tunnel & Terminal Co.

THE electrification of the tunnel and terminal of the Canadian Northern at Montreal, Canada, extends from the terminal station in the city to the yards at Cartierville, a distance of about nine miles. The tunnel, which is underneath Mount Royal and which enables the Canadian Northern, the newest transcontinental railway, to

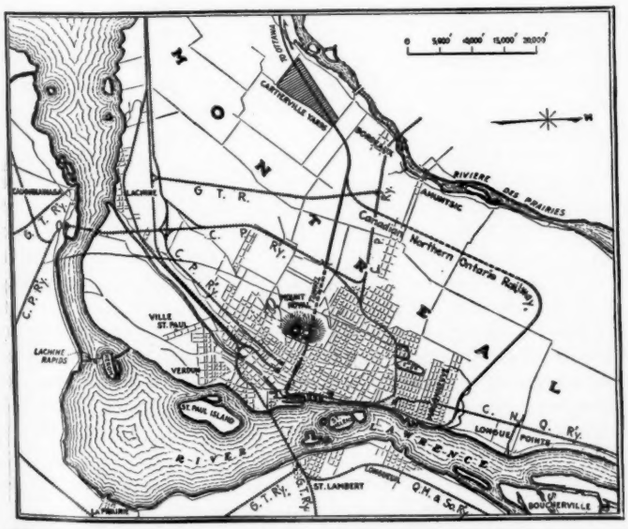


Fig. 2—Map of Montreal and Vicinity Showing the Terminal Electrification Between the City and Cartierville Yards

enter the heart of the city, is of double track construction and is three and one-third miles long. At the other end of the tunnel from the city, the town of Mount Royal is being built up and will be given a quick and frequent service by means of multiple-unit trains. The maps in Figs. 1 and 2 show the location of the tunnel and the yard. A complete description of the terminal and the tunnel, together with an account of the construction methods used, was published in the *Railway Age Gazette* for October 10, 1913, and November 5, 1915.

The Electric System Chosen

The 2400-volt direct-current system was selected after an exhaustive study had been made of all the available systems of electrification. The choice quickly narrowed down to three: namely, single-phase, 11,000-volt trolley; low voltage direct-current, 600-volt contact system; and high voltage direct-current, 1,200 to 2,400-volt trolley. A careful comparison, both as regards first cost and operating cost, was made between these systems.

For the single-phase system, which requires 25 cycles or less, it would have been necessary to install frequency-changers in the substation, as all the available power around Montreal is 60-cycle. Thus one of the chief points in favor of single-phase, the economy of transformation by means of stationary transformers instead of rotating machinery, would not have applied in this case. Another thing against the single-phase system was due to the necessity for a number of multiple unit cars, the cost of which would be extremely high compared with direct-current equipments, owing chiefly to the heavier and more complicated motors for the same output.

In regard to the use of low voltage direct-current, 600-volt trolley, if the electrification is extended for any considerable distance, as seems likely, the 600-volt system obviously would be far more expensive than one in which a higher trolley voltage is used. A third-rail, necessary for

600 volts, was considered out of the question on account of the snow conditions prevalent in Montreal a large part of the year. For these reasons it was thought best to use a voltage of 1,200, 1,500 or 2,400 direct-current. When future extensions were considered, 2,400 volts seemed best on account of the economy in copper and substations.

Source of Power

Power is purchased at 11,000 volts, three-phase 60 cycles, from the Montreal Light, Heat & Power Company, and transformed to the 2,400-volt direct-current trolley voltage in a substation located near the west portal of the tunnel. The trolley line is of the catenary type, and is supported outside the tunnel by means of white cedar poles. The initial installation of electrical rolling stock consists of six 85-ton locomotives and eight multiple-unit motor cars. The repair shop for the electric locomotives and motor cars is at the Cartierville yard.

Substation Equipment.—The alternating-current electrical energy, supplied by the power company at 11,000 volts, is received at the eastern portal of the tunnel in a special splicing chamber which is connected to the power company's central station by cable in underground conduit. The central station of the power company is connected to all its water power plants, including Shawinigan Falls, Cedar Rapids, Soulanges, Chambly and Lachine; and also to steam auxiliary stations.

From the splicing chamber at the east portal the power is transmitted underground by lead cable in clay conduit through the tunnel to the substation at the western portal. In addition to this underground connection to the central

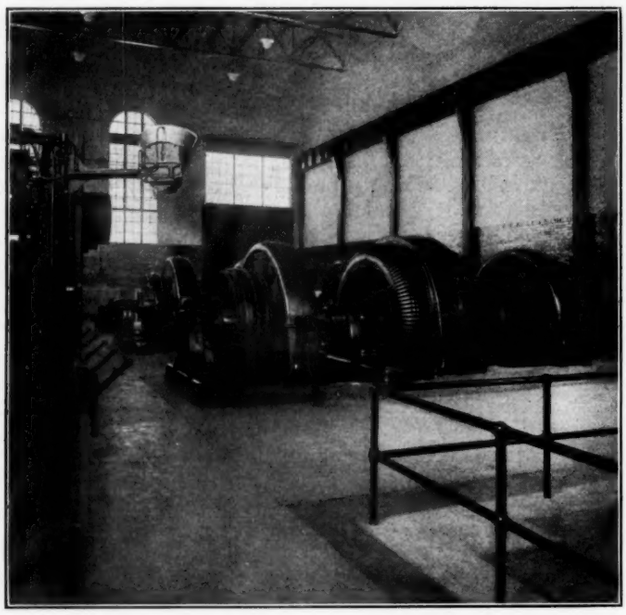


Fig. 3—Interior of Substation

station, the substation is connected to a transformer station at Mentana street by an overhead line about two miles long. With these two connections it is believed that a shut-down due to lack of power will be a very rare occurrence.

Motor-Generator Sets.—At the substation the electrical energy is transformed to 2,400-volt direct-current for the trolley circuits by 1,500 kw. motor-generator sets, two of which are installed at present, one of them being a spare. There is space in the building for a future third set.

Each motor-generator consists of two 750 kw. compound wound, commutating pole, compensated generators each wound for 1,200 volts, insulated for 2,400 volts and direct connected to an 11,000 volt synchronous motor operating at a speed of 600 r. p. m. The motor-generator sets have a continuous capacity of 1,500 kw. each, and an overload capacity of 200 per cent for five minutes. The 1,200-volt generators are permanently connected in series to give the trolley voltage of 2,400. The shunt fields are separately excited. The pole face winding and the series and commutating field windings are all connected on the ground side, so that the armatures are the only parts subjected to the full line potential.

Exciter Sets.—There are three motor-generator exciter sets, each consisting of a 50-kilowatt, 125-volt generator of the commutating pole type connected to a 550-volt, 1,200 r. p. m. induction motor. Normally, one exciter furnishes exciting current to the fields of both synchronous motors, and another exciter furnishes the current to excite the four generators. The third exciter is a spare. Two banks of transformers, one a spare, each consisting of three 100-kilowatt, 60-cycle, 11,000/550 volt, single-phase transform-

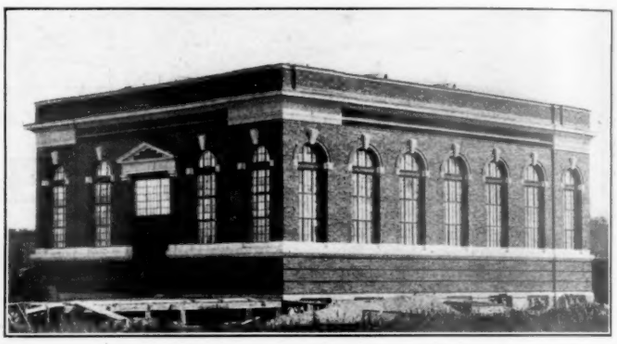


Fig. 4—The Substation Located Near the West Portal of the Tunnel

ers, furnish alternating current at 550 volts to operate the induction motors of the exciter sets and other small motors. Additional small transformers step down from 550 to 110 volts for the station lighting. Emergency lighting is taken care of by means of a storage battery, which also furnishes current to operate the oil switches in case of a complete shut-down, when current from the exciters will not be available.

Switch-Board.—The switchboard is composed of thirty-two panels of natural black slate. The panels control various outgoing circuits for signals, tunnel lighting and miscellaneous power as well as the incoming power circuits and the substation machinery. Nine of these panels comprise the 2,400-volt direct-current board. The 2,400-volt circuit breakers and lever switches are mounted on panels back of and above the main switchboard. They are operated by means of insulated handles on the front of the main board so as to eliminate any possibility of the operator coming in contact with the 2,400-volt circuit. The breakers are enclosed between fire-proof barriers. They are equipped with powerful magnetic blowouts to extinguish the arc, and are provided with a re-setting device operated from the front of the board. The field switches are mounted back of the panels with their operating handles on the front of the main board. The interior of the substation is shown in Fig. 3.

The Substation Building

The substation building shown in Fig. 4 is 88 ft. long by 70 ft. wide by 42 ft. high, and consists of a machinery section and a switching and auxiliary section. The machinery room contains the two 1,500-kilowatt synchronous motor-generator sets, with the foundation for a third set, the exciter sets and the switchboard. A 25-ton traveling crane is provided which will handle the heaviest single piece

of machinery. Under this room there is a basement where rheostats are located beneath the switchboard and where there are also storage and locker rooms. In the basement, arched openings are provided in the foundations of the main synchronous motor-generator sets, through which fresh air from the basement windows is drawn by the suction action of the rotating parts of these machines, thus insuring ample ventilation for the main units.

The switching and auxiliary section is divided from the machinery section by a heavy fire wall. Underneath half of this is a basement containing rooms for oil storage and

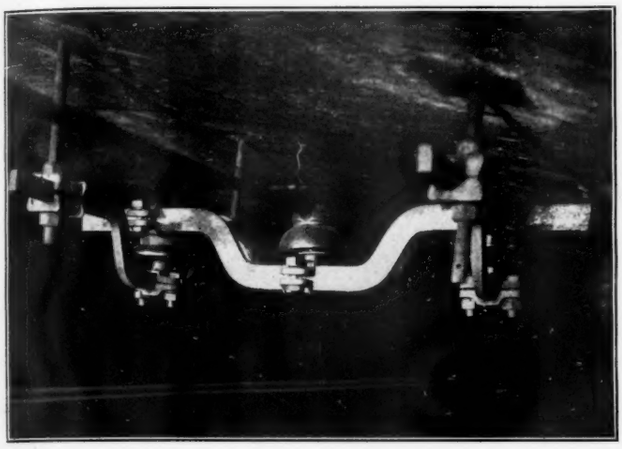


Fig. 5—Catenary Trolley Support in the Tunnel

for the furnace, which provides heat for the building. This section is divided into a bus-bar room, oil switch room, lightning arrester room, power transformer room, battery room and feeder entry room.

Catenary Trolley System

For two or more tracks, the overhead construction is of the catenary cross-span type. The messenger is a ½-in., seven-strand, Siemens-Martin steel cable, supported by cross-spans and wood poles spaced 150 ft. on the tangent. The 4/0 trolley wire is of special bronze composition of greater tensile strength than ordinary hard-drawn copper. It is supported from the messenger by loop hangers spaced every fifteen feet. Both messenger and trolley are anchored every half-mile. Single track construction is similar to that for two or more tracks, except that the messenger is supported on a T-iron bracket attached to the pole.

All insulators are of glazed porcelain tested, when wet, to at least 14,000 volts. The normal height of the trolley above top of rail is 23 feet, outside the tunnel. The wood poles are of specially selected Eastern white cedar, straight and of sufficient height to carry two cross-arms for feeders, signal circuits, and a three-phase power circuit for the shops at Cartierville. The butts of all poles for a length of nine feet were treated with creosote oil by the open tank process, before setting. Thus the creosoted portion extends from two to three feet above the ground surface.

Catenary Construction in the Tunnel.—The messenger cable is of phosphor-bronze, and is supported every 90 ft. by a combination of iron yokes hung from the concrete roof of the tunnel by special bolts, and so arranged that two insulators are in series between the messenger cable and ground. This construction is shown in Fig. 5. Two 4/0 bronze trolley wires are hung, side by side, from each messenger by loop hangers, spaced fifteen feet on each trolley wire. The hangers which support each trolley wire are staggered with those of the other, so that adjacent hangers are spaced 7½ feet. The object of having two trolley wires side by side, is to reduce sparking and wear, and also to limit, by the additional weight, the wave height of the trolley wire when a pantograph passes. This latter consideration is essential because of the small clearance between the top of the messenger cable and the roof of the tunnel. The height of the trolley wires in the tunnel, over the top of the rail, is 16 feet. Rail bonds, both inside and outside the tunnel, are of the flexible ribbon type electrically welded to the head of the rail.

The Electric Locomotives

The locomotives (Fig. 6) weigh 85 tons each, and are geared for a free running speed of 45 miles per hour. The motors are nose supported on the axles and are geared by twin gears to the axles. Each locomotive has four axles with all the weight upon the eight driving wheels. The running gear consists of two four-wheel trucks articulated together by a heavy hinge. The equalization of the trucks is accomplished by a semi-elliptic leaf spring over each journal box, connected through spring hangers to the frame and to the equalizer bars. The equivalent of a three point suspension is thus obtained. The Miner friction draft gear is mounted in the end frame casting of the truck.

The cab, of the box type, is divided into three compartments; the center compartment for the control apparatus, and the two end compartments for the operator. Each operator's compartment is supplied with controller, control switches, ammeter, speedometer, air brake and pantograph control, air gages, 2,400-volt cab heater, bell rope, and control for the whistle and sanders. The locomotive is thus provided with complete double end control.

Motors.—The motor equipment consists of four commutating pole motors wound for 1,200 volts and insulated for 2,400 volts, two of these motors being permanently connected in series for operating on the 2,400-volt trolley circuit. The one-hour rating of each motor is 315 h.p. at 1,200

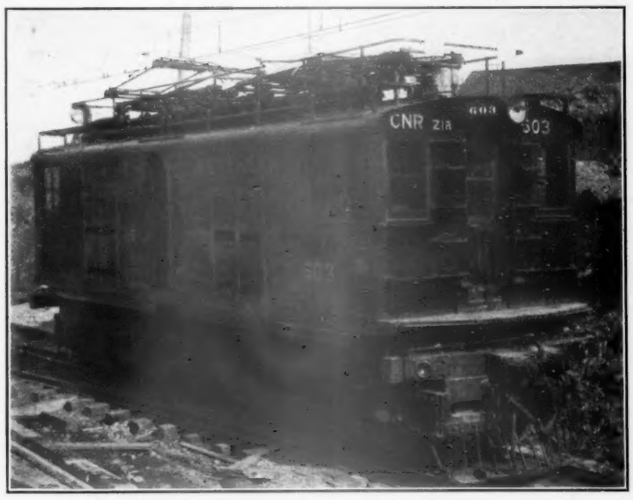


Fig. 6—One of the 85-Ton Electric Locomotives

volts. The motors are designed for forced ventilation, which is obtained by a blower in the locomotive cab. Either pair of motors may be cut out in case of emergency by a special handle on the change-over switch.

Current at 125 volts, for operating the contactors and for lighting the cab, is supplied by a motor-generator set, the motor of which has two 1,200-volt windings and two 1,200-volt commutators in series for operation on 2,400-volts. This set, which is mounted in the center cab, also drives the blower for providing forced ventilation to the main motors. The armature of this generator is fitted with slip rings from which alternating current is supplied to a small transformer for the headlight circuit. Taps on the secondary

side of the transformer give a range of voltage for the headlight lamps so that they may be made bright or dim simply by turning a small switch conveniently located in the cab.

The two trolleys which are placed on each locomotive are of the sliding pantograph type, pneumatically operated and mounted on insulated bases. Combined straight and automatic air brake equipment is used, including a 2,400 volt motor driven air compressor consisting of two 1,200-volt motors operating in series on 2,400-volts and direct connected to an air compressor having a piston displacement of 100 cubic feet of free air per minute.

Some of the principal dimensions and characteristics of the locomotives are:

Length inside knuckles	37 ft. 4 in.
Length over cab	31 ft. 0 in.
Over-all height with pantograph down	15 ft. 6 in.
Height over cab	12 ft. 10 in.
Over-all width	10 ft. 0 in.
Rigid wheel base	8 ft. 8 in.
Total wheel base	26 ft. 0 in.
Total weight on drivers	85 tons
Wheel diameter	46 in.
Tractive effort at 30 per cent tractive co-efficient	51,000 lb.
Tractive effort at one-hour rating	20,300 lb.
Tractive effort at continuous rating	14,500 lb.
Height of center of gravity of total locomotive above top of rail	50 in.
The one hour rating of the motors, shop test, at 1,200 volts according to A. I. E. E. Std.	225 amp.
Their continuous capacity	175 amp.
Cu. ft. air per min.	1,500
Weight of spring-borne parts	127,330 lb.
Weight of non-spring-borne parts	44,400 lb.
Motors	37,020 lb.
Control	22,088 lb.
Air brake eqpt. excl. of compressor	2,240 lb.
Air compressor	3,450 lb.
Mechanical eqpt.	106,942 lb.
Actual weight per axle	42,935 lb.
Dead weight per axle	11,100 lb.
Total weight of locomotive	171,740 lb.

Multiple-Unit Cars

The multiple-unit car equipments are designed for a maximum of five cars per train. The running time between the town of Mount Royal and the main passenger station in Montreal is 7½ minutes for a 5-car train. Beyond the town

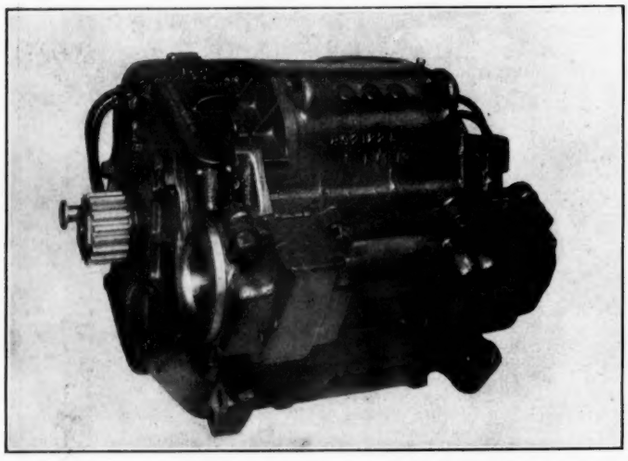


Fig. 7—One of the Four 125 H.P. Motors With Which Each Multiple-Unit Is Equipped

of Mount Royal there will be a stop about once every mile to the end of the electrification. These cars are arranged for a schedule speed of 20.6 m. p. h. with a layover at each end of five minutes. They make the round trip in one hour.

The motor equipment consists of four ventilated 125 h.p. 1,200-volt commutating pole motors, insulated for 2,400 volts. Two of these motors are permanently connected in series for 2,400-volt operation. One of these motors is shown in Fig. 7.

The control is of the non-automatic type for multiple-unit operation. The equipment includes a motor-generator set for furnishing 600-volt current for the contactor circuits, air compressor and lighting circuits. This set consists of two 1,200-volt motors operating in series on 2,400-volts, direct connected to the 600-volt generator. The master controller, contactors, switches, reverser and pantograph are all of essentially the same construction as those already described for the locomotives. The controller handle is provided with means for cutting off power and applying the brakes in case the motorman removes his hand.

Car Heating System.—The electric hot air system of car-heating is used. One complete heater is placed underneath each car and receives its energy direct from the 2,400-volt supply. This heater has a capacity of approximately 42 k. w. and is constructed for two heat combinations so as to

Fig. 8—Locomotive at West Portal of the Tunnel. Only One Track Completed

conveniently and economically provide for the changes in temperature. The heating equipment consists of the heating unit, the blower and the regulating mechanism. The controlling switch and thermostat of the regulating mechanism are arranged for operation from the 600-volt supply. Air is forced through the heating unit by the blower and distributed to the car through air ducts along the sides. The blower is operated by a motor connected in series with the heating unit on the ground side. The capacity of the blower is 1,100 cubic feet of free air per minute.

Multiple Unit Car Construction.—The cars are of steel construction and weigh loaded and equipped approximately 130,000 lbs. Cross-seats are used near the center of the car and longitudinal seats near the ends, thus giving plenty of room near the doors where most crowding occurs when passengers are leaving or entering. The underframing of the car is entirely of steel and the car body is of steel except for window frames, wainscoting and headlining, which are of wood. The heat insulation for the sides, roof and ends of the car consists of 3-ply "Salamander" and is secured to the steel by means of glue and "Clinchite" nails spot welded to the sheet metal.

The outside and inside finish and all the fittings and other details, conform as nearly as possible with Canadian Northern Standard practice. The principal car dimensions are:

Length over buffers	67 ft. 5¾ in.
Length over body corner posts	57 ft. 6¼ in.
Truck centers	42 ft. 9 in.
Width over side sill angles	9 ft. 10½ in.
Width over eaves	10 ft. 2¾ in.
Height top of rail over roof	13 ft. 0 in.
Height top of rail to underside of side sill	3 ft. 7½ in.
Height of floor above top of rail	4 ft. 3 in.
Center to center of body side bearings	4 ft. 10 in.
Center to center of deck sills	5 ft. 6 in.
Seating capacity	64

Train Heaters.—Steam heaters are required in winter to furnish steam to the heating coils of ordinary railway coaches when they are being hauled by the electric locomotives. The heater consists of a vertical tubular boiler ar-

ranged to burn fuel oil. It is equipped with a superheater, located five inches above the top of the flue sheet, which will produce approximately eight degrees F. superheat at 100 pounds boiler pressure. The boiler is covered with cement lagging 2 in. in thickness, reinforced with wire netting and protected by a Russia iron jacket. The oil and water are carried in a tank located near the boiler. The compartment for oil has a capacity of 80 gallons and that for the water, 500 gallons (U. S. Standard).

The boiler is fitted with an automatic feed water regulator, and an automatic device to cut off the fuel supply in case of low water or high pressure. The equipment is capable of evaporating 1,600 pounds of water per hour at a pressure of 100 pounds per square inch with feed water at 50 degrees Fahrenheit, using fuel oil which has a heating value of 17,000 B. t. u. per pound, and delivering superheated steam to the train line. The complete heating equipment is mounted on a small tender coupled next the locomotive.

The first electric locomotive was started and run through the tunnel on April 16, 1917. Six days later the first passenger train was run through, carrying a number of invited guests. Regular passenger service, however, will not be inaugurated before the fall as the station and terminal facilities are not yet completed.

THE WAR TAXATION BILL

The House of Representatives Committee on Ways and Means on Tuesday agreed on the provisions of the War Taxation Bill which it will recommend to the House. The bill is counted on to raise principally by internal revenue levies, $1,800,000,000. It is understood that the Senate Finance Committee probably will rewrite much of the House bill. Open hearings are to be held by the Senate committee. The House committee held no hearings, but received the informal protests and suggestions of the various interests affected. The provisions in the House bill include many relating to the railways, those relating directly to the carriers being as follows:

From and after the first day of June, 1917, there shall be levied, assessed, collected, and paid:

(A) A tax equivalent to 3 per centum of the amount paid for the transportation by rail or water of property by freight consigned from one point in the United States to another;

(B) A tax equivalent to 10 per centum of the amount paid for the transportation of property by express companies consigned from one point in the United States to another;

(C) A tax equivalent to 10 per centum of the amount paid for the transportation of persons by rail or water, within the United States, not including the amount paid for commutation or season tickets for trips less than thirty miles or for transportation, the fare for which does not exceed 25 cents, and a tax equivalent to 10 per centum of the amount paid for seats, berths, and staterooms in parlor cars, sleeping cars, or on vessels.

If a ticket or mileage book used for such transportation or accommodation has been purchased before this section takes effect, the tax imposed by this section shall be collected from the person presenting the ticket or mileage book by the conductor or other agent, when presented for such transportation or accommodation, and the amount so collected shall be paid to the United States in such manner and at such times as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may prescribe;

(D) A tax equivalent to 5 per centum of the amount paid for the transportation of oil by pipe line;

(E) A tax equivalent to 5 per centum of the amount paid for electric power for domestic uses . . .

(F) A tax of 5 cents upon each despatch, message, or conversation which originates at any office, station or exchange within the United States, or by telegraph or telephone line which is transmitted over such line, and for which a charge of 15 cents or more is imposed. . . .

In case a carrier by rail, water, or pipe lines does not, because of its ownership of the commodity transported, or for any other reason, receive the amount which as a carrier it would otherwise charge, such carrier shall pay a tax equivalent to the tax which under the rates or tariffs on file May 1, 1917, with the proper Federal or State authority, would be imposed upon the transportation of such commodity if the carrier received payment for such transportation.

Provided, that in case of a carrier which on May 1, 1917, had no such rates or tariffs on file, the tax shall be computed on the basis of the rates or tariffs of other carriers for like services on file on such date as ascertained and determined by the Commissioner of Internal Revenue.

Provided, further, that nothing in this section shall be construed as imposing a tax upon the transportation of any commodity which is necessary for the use of the carrier in the conduct of its business as such and is intended to be so used.

That no tax shall be imposed under Section 500 upon any payment received for services rendered to officers or employees of the United States, or of any State or political sub-division thereof, in the course of their official business.

That each person, corporation, partnership, or association receiving any payments referred to in Section 500 shall collect the amount of the tax, if any, imposed by such section from the person, corporation, partnership, or association making such payments, and shall make monthly returns under oath, in duplicate, and pay the taxes so collected and the taxes imposed upon it under Paragraph 2 of Section 501 to the Collector of Internal Revenue of the district in which the principal office or place of business is located. Such returns shall contain such information, and so made in such manner, as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulation prescribe.

HOW MUCH RAILROAD EQUIPMENT IS NEEDED TO MOVE AN ARMY?

The suggestion that America may soon be sending overseas an army of men, makes specially timely bulletin No. 2 recently issued by the American Railway Association's special Committee on National Defense. The data in the bulletin was prepared by Lieutenant-Colonel Chauncey B. Baker, of the Quartermaster Corps, United States Army, and distributed to the railroads of the country by this committee.

To move one field army of 80,000 men, consisting of three infantry divisions, one cavalry division and a brigade, technically known as a brigade of field army troops—troops auxiliary to the infantry and cavalry divisions—requires a total of 6,229 cars made up into 366 trains with as many locomotives. These 6,229 cars would be made up of 2,115 passenger, 385 baggage, 1,055 box, 1,899 stock and 775 flat cars. This quantity of equipment represents 0.7 per cent of the locomotives owned by American railroads, 4.2 per cent of their passenger cars, and 0.2 per cent of their freight equipment.

The railroad equipment required to move various organizations of the army at war strength is as follows:

Infantry Regiment
55 officers, 1,890 men
177 animals, 22 vehicles

Cars required
48 passenger cars
5 baggage cars
15 box cars
9 stock cars
8 flat or gondola cars
Total, 85 cars

Artillery Regiment—Mountain
45 officers, 1,150 men
1,229 animals
24 guns

Cars required
30 passenger cars
7 baggage cars
30 box cars
61 stock cars
Total, 124 cars

Artillery Regiment—Light
45 officers, 1,170 men
1,157 animals, 32 vehicles
24 guns

Cars required
32 passenger cars
9 baggage cars
25 box cars
58 stock cars, 46 flat cars
Total, 170 cars

Signal Corps Field Battalion
9 officers, 171 men
206 animals, 15 vehicles

Cars required
6 passenger cars
2 baggage cars
5 box cars
10 stock cars
5 flat cars
Total, 28 cars

Cavalry Regiment
54 officers, 1,284 men
1,436 animals, 26 vehicles

Cars required
36 passenger cars
8 baggage cars
25 box cars
72 stock cars, 9 open cars
Total, 150 cars

Engineers Pioneer Battalion
16 officers, 502 men
165 animals
12 vehicles

Cars required
14 passenger cars
2 baggage cars
10 box cars
8 stock cars
4 flat cars; Total, 38 cars

Artillery Regiment—Horse
45 officers, 1,173 men
1,571 animals, 35 vehicles
24 guns

Cars required
34 passenger cars
10 baggage cars
25 box cars, 78 stock cars
47 flat cars; Total, 194 cars

DANISH STATE RAILWAYS.—Since the beginning of the war the Danish State Railways have suffered as a result of the depreciation of the German mark an exchange loss of £55,000($267,300) in their periodical settlements of accounts with the German railways.

RAILWAY REGIMENTS TO GO TO FRANCE

Announcement has been made by the War Department that orders have been given for the raising as rapidly as possible of nine regiments of engineers who are to proceed to France at the earliest possible moment for railroad work on the lines of communication. The regiments will be composed exclusively of railroad men and each will be commanded by an engineering colonel of the regular army aided by an adjutant. Recruiting points for these regiments will be at New York City, St. Louis, Chicago, Boston, Pittsburgh, Detroit, Atlanta, San Francisco and Philadelphia. Complete details regarding the plan for sending railway regiments to France, which has been under consideration by the Council of National Defense, were not given out by the War Department and the press was requested to publish no speculations or rumors regarding the force. The regiments of engineers will be formed under the provisions of the national defense act of 1916 providing for additional army units of a special character in addition to the ordinary military forces. The men to be enlisted will not be drafted but will all be volunteers.

The response of railway men and engineers to the announcement that regiments were to be raised has already attracted attention. New York City will raise one complete regiment, the First Reserve Engineer Regiment, consisting of 1,061 men and 37 officers under the command of Lt. Col. C. H. McKinstry, Corps of Engineers, U. S. A. Other officers already assigned to duty with it are Captain X. H. Price, Corps of Engineers, U. S. A., and Majors William Barclay Parsons and Arthur S. Dwight and Captains George H. Gifford, John P. Hogan, H. W. Hudson and John D. Irving of the Engineer Officers' Reserve Corps. Several of these officers have been engaged in public service work in New York. The regiment has issued an appeal for recruits from construction or railroad forces in the metropolitan district. It wants enginemen, firemen, yardmasters, telegraphers, brakemen, trackmen, car repairers, superintendents, masons, powdermen, bridgemen and bridge builders (steel), carpenters, machinists, pipefitters, blacksmiths, horsehoers, electricians, etc. The enlistments are for the period of the war only and the men are not subject to draft into other forces. It is hoped that if the response is sufficiently prompt that the first reserve engineer regiment will be ordered into camp next week and will go abroad shortly thereafter. The announcement states that this regiment cannot be raised by draft both because of the skilled men needed and because it is expected that it will be sent to France long before the draft becomes effective.

Up to Tuesday more than 500 men had offered their services. About 500 men have been tentatively accepted and the others were told to report Wednesday for examination.

Major W. P. Wooten and Lt. L. B. Atkins, who have been assigned to raise a regiment drawn from the Boston district, had not yet arrived in Boston. The recruiting officers were forced to turn away several hundred applicants who thronged the headquarters asking questions and requesting that they be enlisted at once. In Pittsburgh 50 men have already been enlisted, including many practical railroad men.

It is believed that each regiment will be placed in charge of a certain section of the railway lines just back of the fighting front.

As showing the importance of the work that the engineers will be called upon to do it is interesting to repeat the remarks of Isaac Marcosson, the American journalist who, speaking on March 2 before the American Luncheon Club in London of what the British railway men have done in the war, said that he thought that the one thing that was going to win the war was the British genius for transport, backed up by British pluck and courage. The British army, he said, had constructed 4,200 miles of railway. He added that he had seen shells tearing up a part of the line, and immediately British Tommies were engaged in repairing it to allow the train due in five minutes, to pass. The American engineers are going to continue and to assist in the work that the British and French have been doing along these lines.

The regiments are being organized under the direction of S. M. Felton, president of the Chicago Great Western and adviser to General Black, chief of engineers of the United States Army. They are as follows: One motive power regiment, consisting of railway motive power officials as officers and railway mechanics as privates; five construction regiments consisting of maintenance of way officials as officers, and track laborers and bridge carpenters as privates; three operating regiments, one of which will be the Chicago railway regiment, the organization of which is well under way as described in the *Railway Age Gazette* of April 27. Two others are to be formed in St. Louis and New York, similar to the Chicago regiment. Each of the nine regiments will have two regular engineer officers of the United States Army as colonel and captain adjutant and regular army medical and commissary staffs. The regiments will be equipped as far as possible in this country. Practically all the officers of the Chicago operating regiment, described recently in the *Railway Age Gazette,* have been appointed, and applications for over 50 per cent of the enlisted men have been received. The officers are as follows: Captain Quartermaster, Clive Runnels, assistant to president Pullman Company at Chicago; Captain Engineer T. W. Fatherson, engineer maintenance of way of the Chicago Great Western at Des Moines; Major First Battalion C. L. Bent, inspector, passenger train and station service of the Illinois Central at Chicago; Captain Adjutant W. G. Arn, assistant engineer maintenance of way of the Illinois Central at Chicago. The captain of the Illinois Central Company is Edward Bodamer, trainmaster at Fulton, Kentucky, the other officers being as follows: First Lieutenant F. P. Nash, general foreman of the shops at Palestine, Ill.; First Lieutenant George T. Sheehan, yardmaster at New Orleans; Second Lieutenant C. M. Chumley, supervisor of bridges and buildings at Memphis. The captain of the Rock Island Company is A. E. Walker, superintendent at Little Rock, Ark.; First Lieutenant H. E. McMullen, trainmaster at Dalhart, Texas; First Lieutenant C. W. Reed, road foreman of equipment at Trenton, Mo.; Second Lieutenant T. W. Brown, roadmaster at Trenton, Mo. The Great Western Company is officered as follows: Captain, E. E. Stoup, trainmaster at Des Moines; First Lieutenant S. V. Rowland, assistant superintendent at St. Paul; First Lieutenant W. J. Calvin, engineer, maintenance of way at St. Paul; Second Lieutenant W. R. Roof, bridge engineer at Chicago. The major, second battalion, has not been appointed. The Captain Adjutant is A. T. Abbott, superintendent of the Rock Island at Des Moines. The captain of the St. Paul Company is B. F. Hoehn, trainmaster at Perry, Iowa; First Lieutenant H. P. Horton, train despatcher at Lacrosse, Wis.; First Lieutenant F. T. Lee, engineer at Portage, Wis.; Second Lieutenant F. W. Sawtelle, trainmaster at Horicon, Wis. The captain of the Chicago & North Western Company is G. A. Holmes, assistant superintendent at East Clinton, Ill.; First Lieutenant E. H. Shaughnessy, trainmaster at Chicago; First Lieutenant E. Schultz, master mechanic at Chicago; Second Lieutenant H. Bakke, trainmaster at Milwaukee, Wis. The captain of the Santa Fe company is L. Overpeck, general yardmaster at Emporia, Kan.; First Lieutenant W. J. Hill, master mechanic at Arkansas City, Kan.; First Lieutenant W. G. Paden, despatcher at Emporia, Kan.; Second Lieutenant S. S. McConnell, clerk in the superintendent's office, Emporia.

COUPONS FOR RAILWAY FARES IN GERMANY.—German railway companies will, it is announced, henceforth accept coupons of German War Loans in payment for tickets.

The Air Brake Association Convention

Functional Interrelation of Parts of the Brake System, Slack Action, Handling Trains on Heavy Grades, Etc.

THE Air Brake Association met for its twenty-fourth annual convention at the Hotel Chisca, Memphis, Tenn., May 1-4, 1916, T. W. Dow, of the Erie Railroad, presiding. At the opening session T. C. Ashcroft, mayor of Memphis, welcomed the association.

President's Address

In his address Mr. Dow emphasized the necessity of having close co-operation between the railway mechanical organizations and dwelt on the importance of careful deliberation in matters pertaining to the reports and recommendations of the association. He also spoke of the demands which will be made on the railroads during the war, which render it imperative that the utmost efficiency be secured in all branches of the service and particularly in the use of the air brake.

FUNCTIONAL INTERRELATION BETWEEN THE COMPONENT PARTS OF THE AIR BRAKE SYSTEM

By W. E. Dean

Because of the complexity of the air brake system, many people, in their close attention to one phase of the air brake problem, overlook the other phases. For instance, many relate wheel sliding directly to braking power or braking ratio, and forget that there are many more factors involved. Again, air brake devices frequently are given close scrutiny as to delivery and release of air at the brake cylinder, without tracing the braking problem on through from that point to the wheel and the rail.

If the brake shoe friction exceeds the maximum possible

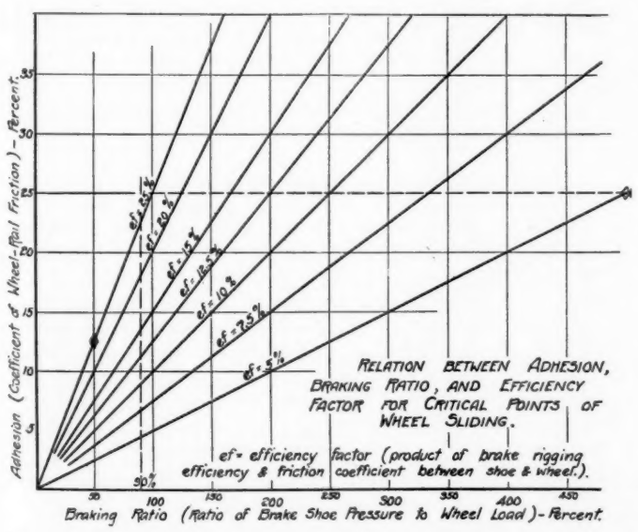

Adhesion (Coefficient of Wheel-Rail Friction) - Percent.
Braking Ratio (Ratio of Brake Shoe Pressure to Wheel Load) - Percent.
ef = 25%
ef = 20%
ef = 15%
ef = 12.5%
ef = 10%
ef = 7.5%
ef = 5%
Relation between Adhesion, Braking Ratio, and Efficiency Factor for Critical Points of Wheel Sliding.
ef = efficiency factor (product of brake rigging efficiency & friction coefficient between shoe & wheel.)

Fig. 1—Relation Between Variables Determining Critical Point of Wheel Sliding

wheel-rail friction, or adhesion, that is, if the pull of the brake shoes tending to lock the wheels is a greater force than the pull of the rail, which tends to keep the wheels turning, the wheels, of course, will slide. Figs. 1 and 2 portray the relation between adhesion, braking ratio and efficiency factor in this balance of forces. By "adhesion" is understood the *limiting* value of adhesion between wheel and rail beyond which more thrust or resistance cannot be given by the rail. The limiting value for adhesion will depend on the condition of the wheel and rail surfaces in contact, which in turn is dependent on many things: weather conditions (humidity and temperature); foreign substances, such as sand or frost, etc. A value of 25 per cent is the average generally taken for a clean dry rail, though it may go as high as 30 or 35 per cent with the presence of sand or as low as 12 or 15 per cent where frost is found.

In order to find what nominal braking force means in the way of brake shoe pull on the wheels it is necessary to multiply it first by the efficiency of the brake rigging and then by the coefficient of friction between shoe and wheel. The combination, or product, of this rigging efficiency and friction coefficient is called the "efficiency factor." The

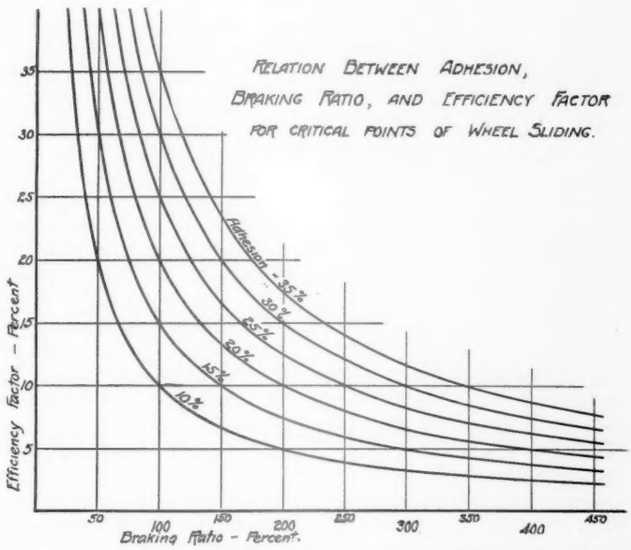


Fig. 2—The Relations Shown in Fig. 1 Illustrated in Another Way

braking ratio for a car multiplied by this efficiency factor gives the retardation factor, or actual retarding force in per cent of the car weight. When this retarding force exceeds the limiting adhesion the wheels will slide.

Whether or not wheels slide, therefore, depends on the adhesion and the efficiency factor as well as on the braking force. Reference to Fig. 1 will show that where the adhesion is 25 per cent wheels may slide with anywhere from 100 per cent braking ratio (where the efficiency factor is 25 per cent) to 500 per cent (where the efficiency factor is but 5 per cent). Again, wheels may slide with 50 per cent braking ratio where the adhesion is but 12.5 per cent and the efficiency factor is 25 per cent. From this it is readily appreciated that wheel sliding is not solely dependent upon braking ratio.

Fig. 2 illustrates the same relations in another way. It is here seen that with a constant adhesion the braking ratio required to slide wheels will be decreased in proportion as the efficiency factor increases.

There is one phase of wheel sliding which has received scant attention, viz., the inability of a six-wheel truck to equalize weight freely from one pair of wheels to another when a brake equipment is used which applies a heavy unbalanced shoe pressure to one side of a wheel only. When

a single brake shoe is applied to a wheel the side thrust must be opposed finally by the opposite pedestal jaw. The friction between this jaw and the journal box prevents the latter from moving up or down freely, with the result that the weight on that pair of wheels may be suddenly relieved in passing over a low spot in the track, and the wheels slid. To keep the braking force the same and decrease the weight is in effect to increase correspondingly the braking ratio. If the balance of forces is in the neighborhood of the

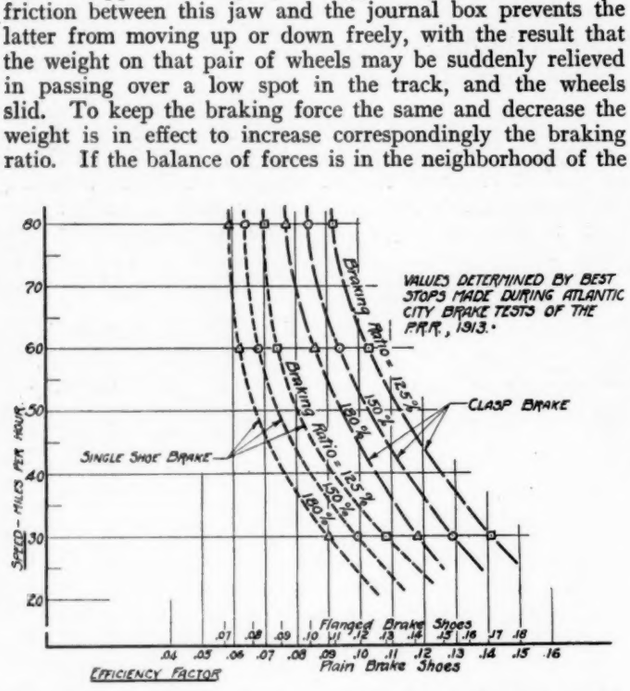


Fig. 3—Efficiency Factors for Stops from Various Speeds with Clasp and Single Shoe Brake Gears and Plain and Flanged Shoes

adhesion limit the wheels are very likely to slide. The remedy here is to balance this brake shoe pressure by applying a similar brake shoe pressure from the other side. In other words, it is to use a clasp brake with equal and opposite shoe pressures on each side of the wheel. To have these two opposing shoe pressures differ in value is only to temporize or dally with the problem.

There is an important interrelation between braking ratio, type of foundation brake gear, type of brake shoe, efficiency factor and speed, which is illustrated in Fig. 3. This is a graphical summary of the values for efficiency factors given

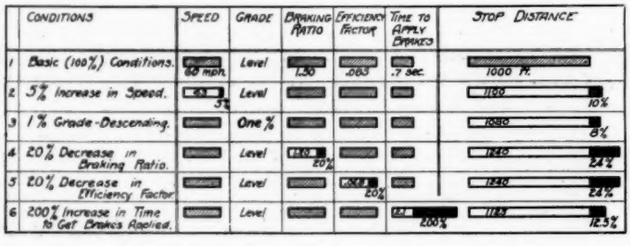

CONDITIONS
SPEED
GRADE
BRAKING RATIO
EFFICIENCY FACTOR
TIME TO APPLY BRAKES
STOP DISTANCE
1 Basic (100%) Conditions. 60 mph Level 1.50 .063 .7 sec. 1000 Ft.
2 5% Increase in Speed. 3% Level 10%
3 1% Grade-Descending. One % 8%
4 20% Decrease in Braking Ratio. Level 20% 24%
5 20% Decrease in Efficiency Factor. Level 20% 24%
6 200% Increase in Time to Get Brakes Applied. Level 200% 12.5%

Fig. 4—Effect on Stop Distance of Variations in Speed, Grade, Braking Ratio, Efficiency Factor and Time to Get Brakes Applied

by S. W. Dudley in a paper presented before the American Society of Mechanical Engineers in New York, February 10, 1914. These values were selected from some of the best stops which were made in 1913 during the extensive Atlantic City brake tests of the Pennsylvania Railroad.

You will note that the efficiency factor decreases as the braking ratio is made greater. For instance, the efficiency factor for 125 per cent braking ratio, the clasp brake and a speed of 60 m.p.h. is .103. For 180 per cent braking ratio it is only .085, all other things remaining the same. You will note as well that the efficiency factor is higher the lower the speed, with any given conditions of braking ratio, type of brake shoe and foundation brake gear. The type of brake shoe, whether plain or flanged, will also affect the value of the efficiency factor as shown in the scale of abscissae at the bottom of the chart. The efficiency factors for the flanged shoe are in every case about 20 per cent higher than for the plain shoe. The successful use of the flanged shoe, however, seems to be limited to the clasp brake because of wheel flange troubles and slid flat wheels arising from its use with the single shoe brake. And finally it will be observed that in every case the efficiency factor for the clasp brake is higher than for the single shoe brake.

A functional interrelation of great interest to those who have to deal with the air brake problem is the one existing between the stop distance for a train, on the one hand, and the speed of the train, the grade, the braking ratio, the efficiency factor, and the time required to get the brakes applied, on the other. Fig. 4 illustrates this interrelation in a graphic manner. The first line gives the basic, or 100 per cent, conditions to afford a basis for all comparisons. The speed is 60 m.p.h., the track level, the braking ratio 150 per cent, the efficiency factor 8.5 per cent, and the mean time required to get the brakes into action is 0.7 second. Where these conditions hold the stop distance will be 1,000 ft. In each case these basic conditions hold except where otherwise noted.

Frequent reference has been made to the superior performance of the clasp brake as compared with that of the single shoe brake. It must be stated with much emphasis, however, that in every case reference was made to a clasp brake designed and installed on correct engineering principles. A clasp brake improperly designed and poorly installed, as for instance on a truck the construction of which does not lend itself to a suitable clasp brake, may not only fail to deliver the performance desired but may actually be less satisfactory than the single shoe brake which is displaced.

Due to the close interrelation and balance in functions existing between the many parts which go to make up the air brake system, care must be exercised to see that a change in one part, more or less desirable, does not introduce changes elsewhere which would render useless or quite defeat the good effects desired.

SLACK ACTION IN LONG PASSENGER TRAINS

Rough handling varying in degree of intensity is reported as occurring during ordinary service applications in handling long passenger trains. This condition is practically universal, although the frequency and severity in such cases vary under varying train conditions, brake conditions and methods of manipulation. The most severe shocks were encountered under low speeds and heavy brake applications.

In order to afford a basis from which the committee might analyze the varying conditions under which good and poor handling prevails, data was collected involving the principal elements to be considered. Some 3,000 observations were reported on trains of from four to 18 cars. For trains up to six and seven cars, little rough handling occurred during brake applications, these not being due solely to slack action, but rather to sudden heavy increases of brake cylinder pressure at low speeds, which produced a high rate of retardation and sudden stops. Shocks involving slack action were confined to starting trains.

Reports received indicate that passenger trains of 14 to 15 cars are quite common in some localities, and that trains up to 18 and 20 cars have been handled successfully. The general practice is to use 90 per cent braking power based on 60 lb. cylinder pressure, although several roads report the basis of 80 per cent on 50 lb. cylinder pressure, and

85 per cent on 86 lb. Pullman cars equipped with double LN equipment brake at 80 per cent on 50 lb. pressure.

Piston travel standing varies materially in different localities, as follows: Minimum, 5 in., 5½ in., 6 in., 6½ in., 7 in., 7¼ in., 7½ in. Maximum, 7 in., 7½ in., 8 in., 9 in. Reports covering experiments with long piston travel, that is, 7 in. to 7½ in., indicate that it is preferable to a shorter travel, and also indicate that there is a tendency to maintain the piston travel considerably longer than the 5½ in. minimum so generally recommended. It is also stated that by changing 6 in. standing travel to 9 or 10 in., standing, all slack action was practically eliminated under the same method of braking, and that from the results obtained a 7½ in. standing piston travel was adopted.

Almost without exception it is the practice to begin the brake application with light reductions, from 6 to 8 lb., although in some instances the range is from 6 to 10 lb. Generally any succeeding reduction following the initial reduction is left to the judgment of the engineer. In releasing the common practice is to use release position of the brake valve, either with direct or graduated release, although running position is used as standard on one railroad where the graduated release is used. The practice of applying the brake before closing the throttle is becoming quite general and is reported as preventing slack action. It is the general practice to stop with brakes applied on the second application, where the two application method of braking is practiced, if the train consists of more than nine cars.

Friction gear is used quite extensively, and appears to be coming into general use. In some instances entire trains are equipped with friction gear, although the types of draft gear in general service necessitates operating trains of mixed spring and friction draft gear.

It is evident from the investigation that draft gears generally are inadequate for present heavy passenger service, draft gear failures occurring universally in starting and stopping trains.

While the single shoe type of brake gear is in use generally, the clasp type of brake gear is being gradually introduced throughout the country, some railroads having a greater part of their cars in heavy through service so equipped.

General practice is to use standard auxiliary reservoirs as specified by air brake companies for the various size brake cylinders, although it is found that auxiliary reservoirs much larger than the above are used.

The investigation has developed the fact that improvement in train handling is possible through instruction and reasonably close supervision with reference to brake manipulation and maintenance. The investigation has also developed the fact that rough handling occurs due to methods of brake manipulation where modern foundation brake gear and brake operating mechanism is in use.

In order to determine the point brought out at the last convention, with reference to maintaining the proper proportion of brake cylinder and auxiliary reservoir volumes as specified by the air brake companies, one railroad company provided an 18-car passenger train for test purposes. The brake equipment on the cars was modified so that the auxiliary reservoir volumes were of such proportions that brake cylinder pressure would be built up in proportion to the brake pipe reduction so that the action of the brakes would very closely resemble the proportions intended by the brake manufacturers. It is very clear from the above tests that notwithstanding the fact that the brake was designed to provide a slow and prolonged service stop, the tendency has been to so change its proportions that its ability to produce a gradual and smooth stop has been greatly reduced or entirely destroyed.

The fact has been established that rough or unsatisfactory handling of passenger trains is universally prevalent; also that an attempt is being made to overcome this condition by prolonging the time in which the train is brought to a stop during service applications, by certain methods of manipulating the brake. It is also established that it is possible under such manipulation to provide satisfactory handling, so far as brake applications are concerned, with the addition of a slightly increased flexibility that can be obtained by a modification in piston travel adjustment.

The report was signed by G. H. Wood, chairman; W. F. Peck; M. E. Hamilton, Mark Purcell, C. U. Joy, L. S. Ayer, T. F. Lyons, L. P. Streeter, M. S. Belk, W. J. Hatch, C. H. Rawlings, J. A. Burke, R. C. Burns and William Spence.

Discussion

The report of this committee was accepted without discussion and the committee was continued for another year. There was, however, a discussion of the paper on this subject by J. A. Burke and W. Hotzfield, which was presented last year (see *Railway Age Gazette* for May 12, 1916, page 1039) but held over for discussion this year. The main points brought out in this discussion are as follows:

Bad shocks are experienced at times with all types of equipment but with proper manipulation satisfactory control of trains can be secured. Among the causes of shocks are variations in the braking power due to lack of uniformity of piston travel, non-standard auxiliary reservoirs, or design of foundation brake gear, and the tilting of trucks equipped with the single shoe type of brake. It has been found best to make a light application before closing the throttle, making any further reduction required to secure the desired braking effect in one application. It is not advisable to use the two-application stop with long trains. The brake equipment should be modified so that it would be easier for the engineman to avoid shocks. Relatively long piston travel is an aid in securing this result. The standard sizes of auxiliary reservoir should be adhered to. The adoption of the clasp brake will result in a great reduction of shocks on passenger trains.

HANDLING HEAVY TRAINS ON GRADES WITH AIR BRAKE

While there are probably many shortcomings of the present practices of train handling on mountain grades, a thorough knowledge of the capabilities of the air brakes, together with a good organization for its proper maintenance, will enable very good results to be obtained.

Railways having heavy grades to traverse should establish convenient "dead line" points where their own and foreign equipment may be inspected properly and repaired before it is permitted to proceed. The establishment of such points need not necessarily be at the point where the descent of grade begins. From records obtained at such points, where a thorough inspection is made, it has been ascertained that a large percentage of the brakes are in a very bad condition, showing excessive brake cylinder leakage. This inspection has also disclosed the fact that the retaining valve and its piping are receiving practically no attention by many railroads operating in level districts.

In order to handle successfully heavy tonnage trains on grades with air brakes exclusively, it is imperative that the retaining valves and pipe be in such condition that they can properly perform their work. It is also essential that brake cylinder leakage be reduced to the lowest possible point. A uniform adjustment of piston travel is required throughout the entire train. All mountain railroad men should realize the importance of having the brake system charged to standard pressure before starting from the summit of any grade. During cold weather, when operating on grades of 4 per cent and when length of train will permit, it is advisable, immediately after starting and before the entire train is on the descending grade, to apply the brakes

and work steam for a short distance for the purpose of wearing off any accumulation of snow and ice that may be between the wheels and brake shoes. Retaining valve handles must be turned to holding position before beginning the descent.

The speed of trains for the first mile should be exceptionally low for the purpose of allowing the wheels to assume a gradual heat, to compensate for expansion. Speeds when on 4 per cent grade should not exceed 10 m.p.h. if braking conditions are favorable. If unfavorable, this speed should not be permitted.

The engineman must understand that the critical time in grade braking is during the recharge of brake pipe and auxiliary reservoirs; also, that he should regulate the application of the brakes to maintain as near as practicable a uniform speed. To accomplish this the one reduction method must be followed. Frequent applications and short holds are preferable to keeping the brakes applied for a long period.

When handling long freight trains, it is necessary to have the slack bunched in advance of the train brake application. There are several ways of doing this, but the important feature to be considered is to bunch the slack gently. This can be done successfully by the use of the independent engine and tender brake, but on account of the liability of bunching the slack too severely, the use of the independent or straight air driving brake for bunching the slack is generally condemned. However, it has been proved by experience that by the use of the independent or straight air brake on the locomotive tender alone, the slack can be gently and successfully bunched at moderate speeds without the danger of overdoing the matter and damaging equipment. If it is desired to make a stop, the driving brake must be cut in and permitted to work in conjunction with the train brakes.

It many times happens that the main portion of the train is passing over reverse curves with the locomotive and head cars on tangent track and descending grade. Under such a condition there is a tendency for the head portion to run away from the rear portion and the use of the independent brake on tender alone is found to be very beneficial in preventing the running and surging of train slack. In such cases the independent brake should be graduated on and when conditions have changed it should be graduated off.

When a stop is made on ascending or descending grade and the locomotive brake is insufficient to hold the train, or where the engine is to be detached, sufficient hand brakes must be applied on head end to hold it on descending grade and on rear end on ascending grade. Under no circumstances should the automatic brakes be depended upon to hold the train while standing.

Liability of wheels sliding is greatest when starting after a short stop, when retaining valves are in use, and sufficient time should be allowed for the retainers to reduce the pressure before attempting to start. Train men should inspect from the ground for wheels sliding; hence, the necessity for the engineman to keep the speed low enough for the train men to get on safely.

Short movements with long heavy trains should be avoided, but if absolutely necessary to be made, a sufficient number of hand brakes must be applied throughout the train to control the slack.

The report was signed by: C. H. Rawlings, chairman; J. E. Fitzgerald, L. S. Ayer and Charles T. Goodwin.

Discussion

On some roads retainers are tested when cars are on the repair track. The weight type of pressure retainer unseats at times, due to jarring, and pressure is lost. Many cars now in service have very low braking power, and maintenance and also manipulation must be of the best. Some special cars used on heavy grades have been braked at 114 per cent on 60-lb. cylinder pressure with good results. The empty and load brake has facilitated the handling of large ore cars on heavy grades. The practice of increasing the train line pressure on trains with inefficient brakes is used on many roads, but some do not consider the practice advisable.

WHAT IS THE SAFE LIFE OF AN AIR BRAKE HOSE?

There are many angles to the question of the safe life of an air brake hose, but, generally speaking, the life is what we make it. From our researches we are led to the belief that the greater portion of air hose failures is due to the destructive practice of pulling them apart, "cornering" cars while switching, couplers passing, etc. While all railroad companies have in their standard code of rules one prohibiting the pulling apart of air hose, this rule is not generally enforced, and hose are therefore subjected to abuses which shorten their life materially. In order to determine the average safe life of an air hose in actual service; or, in other words, the time that should be allowed to elapse after hose are put into service before they are removed, thereby anticipating possible hose failures, inspections and records were made of a total number of 2,500 hose that were removed on account of being burst, and also inspections of 5,000 hose which were still in service.

The burst hose show a very wide variation in the term of service, the minimum being 24.4 months, and the maximum 106 months. This latter was for only two hose. In spite of the fact that some few hose gave a very long term of service, the general average life of burst hose examined was but 28.6 months.

The average life of the hose examined while still in service was 21.3 months, which is low as compared with the average life of those burst.

It is the opinion of the committee that abuses to which hose are subjected, including failure to uncouple the hose by hand, are responsible for most of the damage that causes hose failures. In order to prove this statement 500 burst hose were examined for the purpose of recording the point of rupture. Of these, 245 or 49 per cent burst at the nipple end; 102, or 24 per cent, burst at the coupling end; 153, or 30.6 per cent, burst elsewhere in the hose body. Of the above number, 150 or 30 per cent, burst on the protected, or under side; 135, or 27 per cent burst on the front, or upper side, and 215, or 43 per cent, burst either on the gasket side or on the side in line with the back of coupling. Of the 245 hose which burst at the nipple end, 132, or 50 per cent, were bruised, or kinked as a result of being pulled apart repeatedly.

Examination was also made at one terminal of 16,272 hose which passed through in six days, and the following data was collected: In service less than two years, 11,790, or 72.5 per cent. In service two to three years, 3,433 or 21.09 per cent. In service over three years 1,049, or 6.4 per cent. The foregoing would indicate that not 50 per cent of the hose survived the two year limit and only 6 per cent survived the three year limit.

There was also a record kept in one big yard of the number of hose burst while getting out trains, and a record of the total number of cars handled was kept for the purpose of determining about what percentage of hose could be expected to burst in ordinary traffic. The record showed as follows: Total number of cars handled in thirty days, 284,000; total number of hose handled in thirty days, 568,000; number of hose burst during thirty days, 282; percentage burst of all hose handled 0.05; average life of the hose burst, 29.9 months.

The record for one month made by one observer in only one terminal shows 148 hose ruined by cars "cornering" or couplers passing, which caused the hose to be broken or cut off from the brake pipe. In the 148 cases observed, 30 angle cocks and brake pipe nipples were broken. In all

cases the hose was absolutely ruined before the trains were made up. When we consider that such abuses are of daily occurrence in many busy yards, the resultant damage to air hose may be imagined.

Except in comparatively new hose, less than eighteen months in service, the cover cracks gave little indication of the real condition or probable durability of the hose. That is to say, there were as many burst when slightly cracked as there were when badly cracked. The surface cracks in the hose depend greatly on the ageing qualities of the material supplied by different manufacturers, but do not serve to give a reliable indication of the real condition of the interior fabric.

What may result from hose bursting in moving train is problematical, but to say the least, the damage, delay, and expense usually involved would pay for the hose itself many times over. It would, therefore, seem a matter of economy to remove hose that have been in service 28 months, even though test may not show them to be porous, because the foregoing data indicates that the average hose is liable to failure at any time after that length of service. We believe that if each hose made the same car mileage in the 28 months, they would all be in such a condition that failure might be expected at any time. Removal of air hose at the time limit mentioned would increase the number of hose purchased and, therefore, the total cost for hose; hence, any economy effected would not be apparent in the purchasing and stores account, but would be reflected in the maintenance of equipment account, and in the earning capacity of the various units of equipment.

The question might be asked: Why is the average life of hose not more than twenty-eight months? The answer is:

First: Because of exposure to the elements.

Second: Pulling hose apart instead of uncoupling by hand, "cornering" cars, etc.

Third: The specifications under which some of the hose are manufactured. We have information from one of the large manufacturers that to follow specifications to the strict letter would at times result in a hose of inferior quality. The hose made to specification are not guaranteed for a definite term of service, and so long as the test specimens pass the required tests, there is nothing else demanded of the manufacturer. However, the materials may not at times be those that will age the best.

What can be done to increase the life of the hose?

First: With hose of present manufacture begin the life saving in the hose mounting room. The nipple ends should be rounded off smooth. The hose clamps used in mounting should be flexible and should not be used after they have elongated sufficiently to allow the shoulders to come together when clamping the hose. Particular care should be exercised in mounting hose to see that the lining is not damaged.

Second: Every effort should be made to stop the abuse of hose while switching and have the hose parted by hand.

Third: Hose should be purchased from manufacturers whose product gives the best general results. This is a question that is worthy of deep consideration when we understand that one of our foremost railroad companies purchased as many as 700,000 hose in one year.

The committee feels that we should not close the paper without bringing to your attention the possibilities of a properly made braided hose as compared with a wrapped hose, and furnishing some comparisons with reference particularly to their ability to pass the M. C. B. test. The M. C. B. tensile, stretching and friction tests cannot be made satisfactorily, owing to the impossibility of detaching the tube from the cover.

Porosity Test.—Test showed porosity practically nil. Hose practically all rubber in one homogeneous mass. Absorption test showed that hose totally immersed in water for one week absorbed only 0.8 per cent moisture.

Bursting Test.—Average bursting pressure 1,400 lb. Expansion at 1,000 lb. pressure 3-16 in. in circumference. Elongation practically nil. Special abrasion resisting cover used of tensile strength about the same as 1913 M. C. B. Specification. There can be no ply separation in this hose.

As the price of braided hose was only slightly greater than that of wrapped hose, at the time the test was made, the braided hose should be tested out in actual service; the matter of using it instead of wrapped hose is one well worthy of consideration.

We were unable to obtain any reliable data to show whether the burst hose examined were removed from passenger or freight equipment. However, hose in passenger service cannot be expected to last longer, than those in freight service, for while they are not usually subjected to such rough treatment as are the freight hose, they are generally operated with higher pressures, and make much more mileage than do freight car hose.

If more testing with soapsuds was done on the repair tracks, considerable economy would result by the removal of porous hose, because they are responsible for much of the delay occasioned in getting out trains and for much of the damage incurred while braking moving trains.

The report was signed by M. E. Hamilton, chairman; Jos. W. Walker, M. S. Belk and George W. Noland.

Discussion

The stresses in the hose when they are allowed to uncouple are quite high, especially with hose couplings which do not conform to the standard custom. The practice of uncoupling by hand has caused a marked reduction in the consumption of hose. Removing hose at regular intervals and testing with soapsuds when cars are on repair tracks resulted in eliminating failures. The use of hose protectors is not advisable but hose should be mounted carefully. It was suggested that it might be well to change the angle at which hose are hung so that they will be bent less when coupled.

The association voted to recommend to the M. C. B. Association that a rule be provided that air brake hose, as at present manufactured, be removed 30 months after date of manufacture.

Other Business

Other papers were presented by R. C. Burns on "Cleaning and Lubricating Brake Cylinder Packing Leathers," and by the committee on "Recommended Practice." On Thursday Walter V. Turner gave a lecture, illustrated with moving pictures, on the operation of a triple valve also showing lantern slides of freak inventions. On Wednesday Mr. Turner gave a lecture on the manufacture of shrapnel shell.

There were more than 200 members registered and 150 guests. The secretary reported a good increase in the membership and also in the balance in the treasury during the past year. The association voted a considerable fund to be given to the American Red Cross.

The following officers were elected: President, C. H. Weaver, N. Y. C. West of Buffalo; first vice-president, C. W. Martin, P. R. R.; second vice-president, F. J. Barry, N. Y., O. & W.; secretary, F. M. Nellis, Westinghouse Air Brake Co.; treasurer, Otto Best, Nathan Manufacturing Company.

Women Workers on the Prussian State Railways.—The Prussian Railways report laid on the table of the Prussian House of Deputies shows that in December, 1915, 22,700 women, out of an average total number of employees of 534,250, were employed on the State Railways. Before the war only 591 women were employed. Of the female employees 8,426 are engaged in maintenance of way work.

How to Increase Railroad Efficiency

Executive Committee Suggests Ways of Showing What Roads Can Do in Co-operative and Unified Service

THE executive committee of the American Railway Association Special Committee on National Defense has issued the following circular to the railroads of the country outlining ways to increase the efficiency of the railroads:

The European war is responsible for conditions that have caused very large increases in traffic on American railroads, whose capacities are now overtaxed, and they are unable to respond promptly to all demands made on them. In other words, there is a demand for transportation that is not being supplied, and it becomes the duty of your committee to suggest how the present high efficiency of American railroads might be still further raised so as to increase the supply of transportation units with existing plant, forces of skilled and unskilled labor, and supplies of fuel and equipment which cannot be increased because the demand for all of these far exceeds the supply.

Your committee prefaces its suggestions by saying that to many roads they may be unnecessary, but they are offered to all in the hope that they may find them helpful.

It is also recognized that some of these suggestions will increase operating costs, but their purpose being to increase the capacity of the plant the result is deemed to justify sacrifice in a national emergency.

Motive Power Should Be Conserved

1. About 15 per cent of locomotives are ordinarily under repair; if this percentage were reduced to 10, which figure has been reached by some roads, it would mean an addition of 3,325 locomotives to the number in service.

2. The average miles run per day by a locomotive is 75. If by quick turning at terminals, double crewing or pooling, improving the quality of water which may enable a locomotive to double a division without loss of fuel and time involved in cooling down, and with less boiler repairs, this mileage can be increased to 90, which is now reached on some roads, it is equivalent to adding 13,300 to the locomotive equipment.

3. Close attention to boiler repairs enables the locomotive to carry full steam pressure, develop full power at all times, and avoid reductions of pressure demanded by weakened boilers with consequent loss of tractive power.

4. Constant and close inspection of firing methods which will reduce the escape of combustion units in heavy black smoke, also waste of steam blowing off when locomotives are standing, will save fuel and conserve much of it for useful work. During each second a locomotive is "popping" a quarter of a pound of coal is wasted, i. e., a lump of about two inches cube. Careless or ignorant use of steam by the locomotive runner may easily waste a ton of coal on a 100-mile run.

5. Locomotive tractive power falls very rapidly as speed is increased; 20 per cent to 30 per cent more freight can be hauled to limiting the speed and utilizing the full tractive power of the locomotive at 12 or 15 miles per hour. A locomotive is a traveling power plant, 20 per cent to 30 per cent of whose power output frequently is wasted by non-use after generation, either through ignorance or carelessness, in not giving the locomotive its full rated load or in unnecessarily high speed.

6. Excite a spirit of emulation by reporting and circulating the money value of waste of power generated in locomotives and not used.

7. Defer scrapping light locomotives which might be used in branch or light main line service. This will conserve motive power for moving freight.

Increased Car Efficiency

The efficiency of cars can be increased by:

(*a*) Quicker terminal handling and prompter loading and unloading.

(*b*) Better loading—more tons per car.

1. From statistics lately collected, the average time consumed by shipper and consignee averages a little under two days each,—a total of about four days per trip of a freight car for both loading and unloading. This was under the old demurrage rules, and those now in effect should reduce this time to about 3½ days. Under the old one dollar straight demurrage rule the average detention, including free time of a freight car when in the hands of a shipper or consignee, was 1.73 days. In California, under the $3 demurrage rate, it is about 0.97 days, or approximately one-half.

2. There are 2,350,000 railroad owned freight cars in the United States and about 225,000 privately owned freight cars, a total of 2,575,000, of which about 6.5 per cent, or 167,000, are normally under repair; close watching and prompt repair work can reduce this percentage to 4, which would release 64,000 cars for active service.

3. The average miles run per freight car per day is 25. Increasing this to about 30 miles, or 20 per cent, is equivalent to adding 515,000 freight cars, or 20 per cent, to existing equipment.

4. Reduce idle time in city and freight division terminals by prompt despatch of trains.

5. Load and unload both company freight and commercial freight promptly—the first, by close inspection and by disciplining offenders; the second by personal appeal by local agents, division and assistant superintendents, and district traffic officers, to shippers and consignees, all of whom can aid greatly by explaining difficulties and obtaining the co-operation of railway patrons in overcoming them through an appeal to their friendship and patriotism. The expenditure of much time, patience, and even money, to make the reform easy in the beginning, is fully warranted. Some one or two consignees can always be found who will co-operate, and once the possibility of accomplishing the desired end is demonstrated, others will quickly follow. There are probably from 250,000 to 300,000 points in the United States where freight is received and delivered. A slight improvement at each will make an astounding aggregate.

6. Increase car loads, which have not kept pace with increase of car capacity, notably in the case of box cars, as shown below:

Average capacity of all cars	39.7 tons
Average load per car, all cars, revenue freight	15.5 tons
Average load per car, all cars (including company freight)	17.0 tons
Per cent of capacity utilized	43 per cent

7. Enlist the interest and co-operation of shippers in loading cars heavier as a war measure, using the services of local agents, superintendents and assistant superintendents, traffic officers, etc., to approach them, concentrating effort on a few friendly ones at first to lead the movement and set the example. Urge shippers and consignees not to ship beyond their ability to promptly handle. Point out the importance to shippers of extending private sidings to correspond with their increased traffic and in improving their facilities to

avoid car delay, and where possible, to arrange their shipments so as to be made uniformly and at periods of the year when cars are least needed to move crops. Require reports of local agents of percentage of cubic and weight capacity of cars loaded at their stations, both as to carload and less than carload freight, also reports of waste in use of cars received by them light-loaded. Publish the results of loading monthly, to excite a spirit of emulation, which will soon affect every agent on the line. Freely interchange with connections reports of light-loaded cars, to correct inefficient loading.

8. Load all cars to 10 per cent in excess of their marked weight capacity. An increase of two tons per loaded car would be equivalent to adding over 200,000 cars to the number available for public use.

9. Where many sheep or hogs are handled, use double-decked cars.

10. Urge traffic officers to make strenuous and concerted effort to get the consent of the public to increase carload minima, thereby increasing the weight of commercial units.

11. Where commercial units are half or less than half the capacity of the car and two shipments are destined to the same point, persuade the shipper to load the two shipments in the ends of the same car.

12. Consolidate under-loaded merchandise cars at designated transfer points and avoid movement of light-loaded equipment.

13. Reduce in every legitimate way empty car haul of either system or foreign cars by watchful car distribution.

14. The increased number of freight cars available for service without any outlay of capital through (a) quicker repairs 64,000, (b) quicker movement 515,000, (c) heavier average loading 200,000, totals 779,000.

Importance of Train-Loading

1. Move company freight and supplies so far as possible on trains that cannot otherwise carry full tonnage. Operate work and construction trains as far as possible in slack times. Store company fuel in slack times.

2. Substitute where possible mixed train service for separate passenger and freight train service on branch lines. Closely review the number of scheduled freight trains operated where tonnage is insufficient to fully load them, with a view of reducing the number to trains actually needed to accommodate the traffic.

3. Make the question of train loading one of primary importance, with division officers, train and yard crews through closely checking, at least weekly, records of train performance and giving publicity to those making good and poor records.

In General

1. One of the greatest opportunities to increase car efficiency lies in better control of an unusual traffic movement through placing embargoes promptly so as to avoid congestion and delay. The importance of keeping yards and terminals, especially in large cities and at seaports, clear of accumulations which cannot be handled expeditiously, cannot be over-estimated. The experience of the past year has shown that the number of cars held in such accumulations, together with those unduly detained by shippers, have been the chief causes of car shortage. The importance of this question demands the closest possible attention on the part of transportation officers, so that freight which cannot be moved will not be loaded in cars, which are thereby taken out of service as effectually as if they were not in existence.

2. The executive committee has announced a policy as to car service and has entrusted to the Commission on Car Service the duty of making that policy effective. Unless all carriers co-operate loyally and completely little will be accomplished and the railroads of the United States will be foredoomed to failure in a national crisis. We must recognize that although our railroads have carried a record-breaking traffic since the commencement of the war in Europe, there have been many delays and shortage of service for which they have not been altogether responsible, but which nevertheless have sorely taxed the forbearance of the public. Following these vexing conditions our country has entered the war, which increases and intensifies them.

The committee realizes that it is difficult to obtain the maximum effect of these suggestions because of the great demand for men in all industry and for government service. It is, however, believed that the American railway man is as patriotic as any other, and will help in this national crisis.

You are urged to have meetings at division points with officers and employees where the seriousness of the national situation can be explained verbally and the greatest interest aroused in this subject of increasing the ability of the American railroads to furnish a larger quantity of transportation with the present plant. This is a result to which it is the patriotic duty of every man in railroad service to contribute his maximum effort.

You are also urged to use the forces of the freight and passenger departments in having meetings with commercial bodies and with shippers so as to enlist their aid in obtaining the desired efficiency.

3. *To our railroads and their officers is presented the opportunity of showng what they can do for their country, and your committee appeals to you to make extraordinary efforts to demonstrate what can be accomplished by the* 262,000 *miles of our railroads in co-operative and unified service.*

Daniel Willard on Railroads in War

Some of the plans that have been under consideration by the executive committee and some of the work already accomplished were described by Daniel Willard, chairman of the Advisory Commission of the Council of National Defense, in an address before a conference of state governors and their representatives at Washington on May 4. Mr. Willard said that he had asked the railroads in effect to turn over to the committee of five their entire properties to be used in the interest of the government and that this committee is now directing the transportation of the nation. The government has given no guarantee, such as was given to the railroads of England, to the 175 roads that have signed over their properties to this government, but it has nevertheless the equivalent of public ownership of 250,000 miles of line. He said that while other nations have almost discontinued passenger service, it is hoped that in this country the number of passenger trains can be reduced by eliminating duplication without inconveniencing the public greatly, thereby making it possible to release 4,000 passenger locomotives for freight service. By reducing the free time allowed shippers and consignees from 48 to 24 hours 245,000 freight cars could be released for one trip. Germany has reduced the free time to six hours.

The railroads are now handling more freight than ever before but they cannot handle all that is in sight and it will be necessary for the committee to decide which freight shall have preference. Already it has taken steps to fill the coal yards for next winter and at the request of the agricultural department seeds and agricultural implements will also be given preference. By persuading shippers to use box cars for coal shipments to the west the empty back haul on steel gondolas has been saved.

Mr. Willard also explained that a railroad commission has been formed to be sent to Russia to assist in building and operating railroads in order to better the facilities for handling food and munitions, and that railroad materials, locomotives and cars will also be sent to Russia and France. In this way the railroads are helping to avert the disastrous consequences which might result if Russia should be com-

pelled to yield to Germany, thus releasing the armies now engaged on the eastern front for service on the western line.

RAILROAD COMMISSION TO GO TO RUSSIA

The commission to go to Russia will consist of John F. Stevens, consulting engineer and formerly chief engineer of the Panama Canal; Henry Miller, vice-president of the Wabash; and Joseph E. Greiner, consulting bridge engineer of the Baltimore & Ohio.

It is understood that France has asked for 10,000 railway employees and material for 1,500 miles of track.

George J. Bury, vice-president of the Canadian Pacific, who has recently returned from a visit to Russia undertaken at the request of the British government, and who has had opportunities for observation of European railroading during the war, has been in consultation with the Advisory Commission of the Council of National Defense.

DERAILMENTS DUE TO DEFECTIVE EQUIPMENT*

By William Queenan

Assistant Superintendent Shops, Chicago, Burlington & Quincy, Aurora, Ill.

During a period of 21 months, beginning December 1, 1914, and ending September 1, 1916, one of the western railroads had 350 derailments caused by defective equipment. These derailments had 44 different causes; 189 of them were on equipment owned by the railroad and 161 on foreign equipment. The table shows a list of the causes and the number of derailments from each cause, divided according to the ownership of the cars. The derailments recorded under the last four items in the table, were each the result of a separate cause and have been roughly grouped in four classes.

Defects	Cars		
	Owned	Foreign	Total
Brake beam down	35	36	71
Broken wheel	21	15	36
Coupler pulled out	17	16	33
Broken journal	10	17	27
Burst air hose	21	5	26
Burnt journal	11	12	23
Loose wheel	9	11	20
Broken flange	16	4	20
Broken arch bar	5	5	10
Broken axle	3	6	9
Broken oil box bolts	4	4	8
Broken truck side	4	3	7
Broken brake rod	3	3	6
Sharp flange	3	2	5
Broken brake hanger	2	3	5
Broken knuckle	5	..	5
Broken truck	1	3	4
Brake rod down	2	2	4
Draft timbers pulled out	..	3	3
Worn knuckle	2	..	2
Broken train line	1	1	2
Broken equalizer	2	..	2
Miscellaneous truck defects	5	6	11
Miscellaneous underframe defects	5	1	6
Miscellaneous brake rigging defects	2	1	3
Miscellaneous coupler defects	..	2	2
Total	189	161	350

The 71 derailments caused by the dropping of brake beams are a little more than 20 per cent of the total number of derailments recorded. This is entirely too many accidents traceable to one cause. That this particular cause of derailment is not confined to any one railroad, however, is well brought out by the statement contained in the 1915 Proceedings of the Master Car Builders' Association, showing that about 37 per cent of the derailments of one eastern road resulted from this cause.

The most frequent cause of dropped brake beams is the loss of brake hanger pins. These pins are secured in several ways; the most common practice is to use a cotter or split key, or a common nut with a lock nut. No matter which of these fastenings is used, its security depends entirely upon the care with which it is applied. Frequently the nut is not turned up on the bolt sufficiently, or the nut lock is left off entirely, or the cotter key may not be split sufficiently to prevent it from working out of the hole in the pin. What is needed is a device by which the pin becomes automatically locked in place when it is inserted. I believe that such a device can be developed and when it is it will do away with a great many derailments resulting from dropped brake beams. The accidents from broken or defective wheels and axles emphasize the fact that cars cannot receive too careful inspection. In many railroad yards car inspectors are burdened with other duties, such as taking seal records, opening the doors of box cars and examining the contents, which frequently interfere with their primary duty of inspecting freight cars for mechanical defects. It is much better to employ other help to secure seal records and the many other records which car inspectors are sometimes asked to get, than it is to allow this class of work to interfere with the principal duty of the inspector.

The derailments caused by the pulling out of couplers and draft timbers are mostly the result of operating old, low capacity cars in heavy trains.

Derailments caused by bursted air hose are difficult to prevent. The ordinary inspection of air hose is not likely to detect hidden defects in the hose. The outer casing of air brake hose checks from different causes; this allows moisture to penetrate to the inner fabric, causing it to decay until it is unable to withstand the pressure and it bursts. A better quality of air brake hose should reduce the number of derailments from this cause.

* From a paper read before the Car Foremen's Association of Chicago.

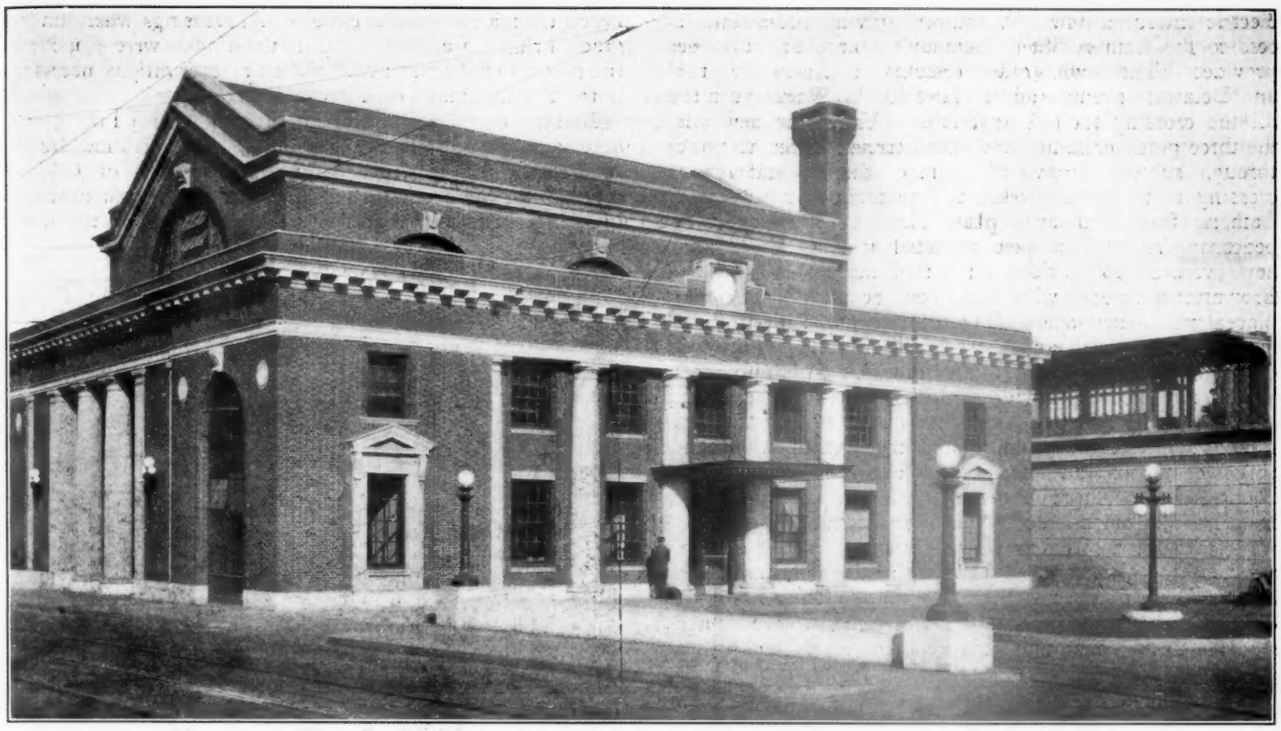
ACCIDENT PREVENTION ON THE NORTHERN PACIFIC

The bureau of efficiency of the Northern Pacific has compiled a record of the personal injuries to employees on that road during 1915 and 1916 with an analysis of their causes which it is sending to employees. This analysis includes 3,333 accidents in 1916 involving the loss of one or more day's time as compared with 2,795 in 1915. During last year 7 per cent of these accidents resulted from physical causes (those controllable by the company), 90 per cent from negligence and 3 per cent from other causes.

While the total number of accidents increased considerably last year, this is ascribed in large part to the great increase in the volume of business handled and to the fact that many inexperienced men were employed. The injuries per 100 men employed during 1916 were 1.0 as compared with 0.9 in 1915.

Accompanying these statements circulars were sent to the division superintendents calling to their attention the fact that every accident is a notice that something is wrong; that accidents are expensive and generally cost less to prevent than to incur and that some one is responsible for preventable accidents. Particular emphasis is laid upon the importance of not allowing obstructions to remain where men walk and work. The importance of personal contact with the men and the discussion of the subject of accident prevention is also emphasized.

CANADIAN PACIFIC RAILWAYMEN WITH THE COLORS.—The Canadian Pacific is credited with giving more men to the British army than any other organization in Canada. Up to January 1, 7,114 employees of the company had enlisted. Of this number 176 have been killed and 415 wounded. The police department of the railway has given 76 constables to the army. Many of these are veterans who have fought in other wars, the majority of them having passed through the South African campaign, while others have also seen service in various parts of the world.



East Elevation of the Johnstown Station.

Pennsylvania Track Elevation at Johnstown, Pa.

A Description of the Interesting Problems Involved in Heavy Work Handled Under Unusually Dense Traffic

THE Pennsylvania Railroad is now carrying on extensive track elevation work at Johnstown, Pa., which extends over more than six miles of its main line and about three miles of the Sang Hollow freight line, which joins the main line at a point approximately three miles west of the Johnstown station. The project also includes the elimination of grade crossings with several of the streets, additional tracks, a new six-span, double-track, deck girder bridge across the Conemaugh river connecting the Sang Hollow freight line with the main line, a new bridge over the double-track railroad of the Cambria Steel Company and a modern passenger station with high island platforms and tunnel approaches. In the aggregate, including the necessary purchase of additional right of way, the project represents an outlay of more than $3,000,000. The work has been carried on under very heavy traffic including approximately 200 trains passing through the city daily, in addition to the switching movements necessary to serve the adjoining industries properly.

The location of the line through Johnstown is such that any plan for increasing the facilities was difficult of consummation. This is especially true for the section through the heart of the city where the right of way is bounded on both sides by very valuable and highly developed industrial property, thus prohibiting any extensive purchase of additional land. The proximity of the Little Conemaugh river on the south with a definite harbor line established by the city further complicated the problem.

To meet this situation and permit the full development of the available property, more than 6,100 ft. of retaining walls have already been built, requiring approximately 28,200 cu. yd. of concrete and 16,300 lin. ft. of Simplex piling. In addition to these walls already placed, 6,000 ft. remain to be built which will require 30,000 cu. yd. of concrete and 25,000 lin. ft. of concrete piles. In the immediate vicinity of the station, however, it was necessary to purchase additional right of way from the Cambria Steel Company. This property at present is used as a storage yard for steel and before it can be utilized for railroad purposes the yard equipment, including scales and two electric gantry cranes, will have to be re-located and the stock piles removed.

The plans provide for the replacement of the old four-track layout with six tracks through the station grounds. The two eastbound and the two westbound passenger tracks will be placed in the middle with the freight tracks on the outside. The new structures have all been built with space provided for the final layout, but because of the limitations of the present bridge across the Conemaugh river at a point 1,200 ft. west of the station, a temporary four-track layout was installed.

This bridge is a stone arch structure of seven 70-ft. spans, five over the river and one span each over Iron street and the Cambria Company's tracks. It was originally designed for four tracks spaced 12 ft. 2 in. center to center, but by building cantilever projections on the deck to retain the ballast, space will be provided for spreading the tracks to 13 ft. centers and for a foot walk for employees. In the final layout an additional bridge will be erected over the river with space provided for two tracks, thus completing the six-track scheme.

Previous to the undertaking of the present project nothing had been done toward the elimination of crossings at street grades since the construction of the road. At that time, three overhead bridges were provided, one at Brownstown road and one at Third street to carry street traffic and the third at First street for the Southern Cambria Railway, an

electric interurban line. A subway giving pedestrians access to the Cambria Steel Company's plant had also been provided. These with grade crossings at Laurel, Fairfield and Delaware avenues and at Haws Brick Works furnished all the crossing facilities available. Under the new plan, the three grade crossings have been carried under the tracks through subways, provision is made for an underground crossing at the brick works, the pedestrian subway at the Cambria Steel Company's plant has been extended, a new pedestrian subway has been provided at First street, and a new overhead foot bridge built at Sixth street. The old Brownstown bridge, which has been repaired, is to be replaced with a new span. The old structure at Third street has been torn down and a new bridge erected a little east of the old site, to permit lighter grades on the approaches.

The new profile provides for easy ascending eastbound grades ranging from 0.06 per cent to 0.3 per cent. Beginning at zero at the west end of the improvement, the separation of the old and new grades attains its maximum of about 12 ft. at Fairfield avenue, where a level grade was installed that extends across Delaware avenue. From Delaware avenue east the grade still ascends but at a lighter rate than the old, which it intersects at the Conemaugh river bridge. East of the river the new grade closely follows the old to a point west of the station, where the two grades again separate until a maximum difference of about 12 ft. is obtained at the west approach to the Johnstown yard. Through the yard, which was elevated with the main tracks, the new grade, although still ascending eastbound, is lighter than the old, thus helping operating conditions. It intersects the old grade line at the east throat of the yard.

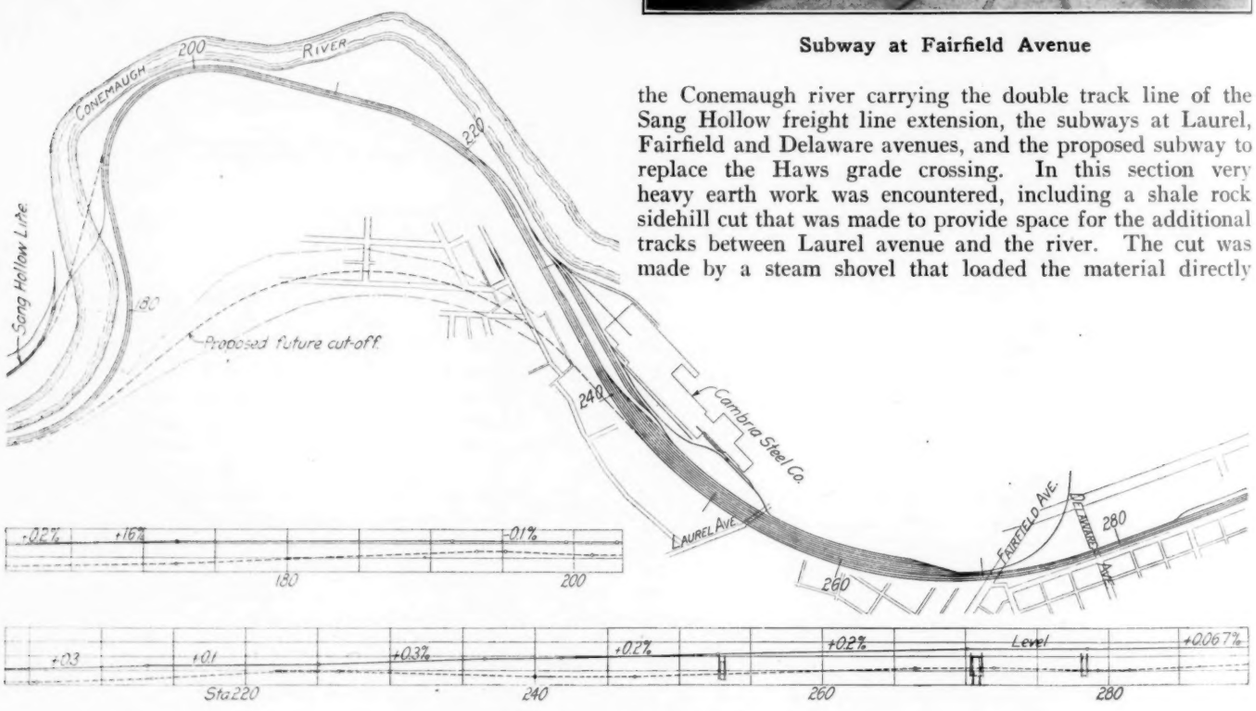
The track was raised under very heavy traffic by company forces, being done gradually by a succession of small lifts, each raise being only a few inches, so that the track was out of service only while the slag train was passing over it. The material used was either granulated slag or engine cinders, which was brought to the site in hopper bottom steel gondolas and was dropped out slowly as the train moved ahead. The lining and surfacing gangs followed the material trains closely. At crossings where undergrade bridges were to be built, the tracks were sometimes raised on blocking to avoid the extra excavations necessary if the lift was made on the cinders or slag.

Because of the change in grade in the main line, it was necessary to also raise the grade of the Sang Hollow freight line extension. There a maximum gradient of 0.3 per cent is maintained and, as the traffic is comparatively light, no special difficulties attended this part of the work.

The Section West of the River

Because of the extent of the territory covered by the project the work is being carried on in two sections, divided by the main line crossing of the Conemaugh river. West of the river the principal structures are the six-span bridge over the Conemaugh river carrying the double track line of the Sang Hollow freight line extension, the subways at Laurel, Fairfield and Delaware avenues, and the proposed subway to replace the Haws grade crossing. In this section very heavy earth work was encountered, including a shale rock sidehill cut that was made to provide space for the additional tracks between Laurel avenue and the river. The cut was made by a steam shovel that loaded the material directly into standard-gage construction cars or low side gondolas placed on a construction siding. When loaded the cars were hauled to the waste dump by the railroad.

Subway at Fairfield Avenue



Map and Profile of the Track Elevation

The work here was complicated by the presence of a mine heading located on the site of the new tracks, necessitating a new heading that will be built as a part of the retaining wall that will join the new abutment to be provided at the Brownstown road bridge. As a further complication, the water from the mine is discharged at this point. This water will be cared for by an extension to a culvert located east of the bridge. Near the east end of the cut a small stream was encountered that, because of its steep grade, has always caused trouble. In widening the cut the conditions

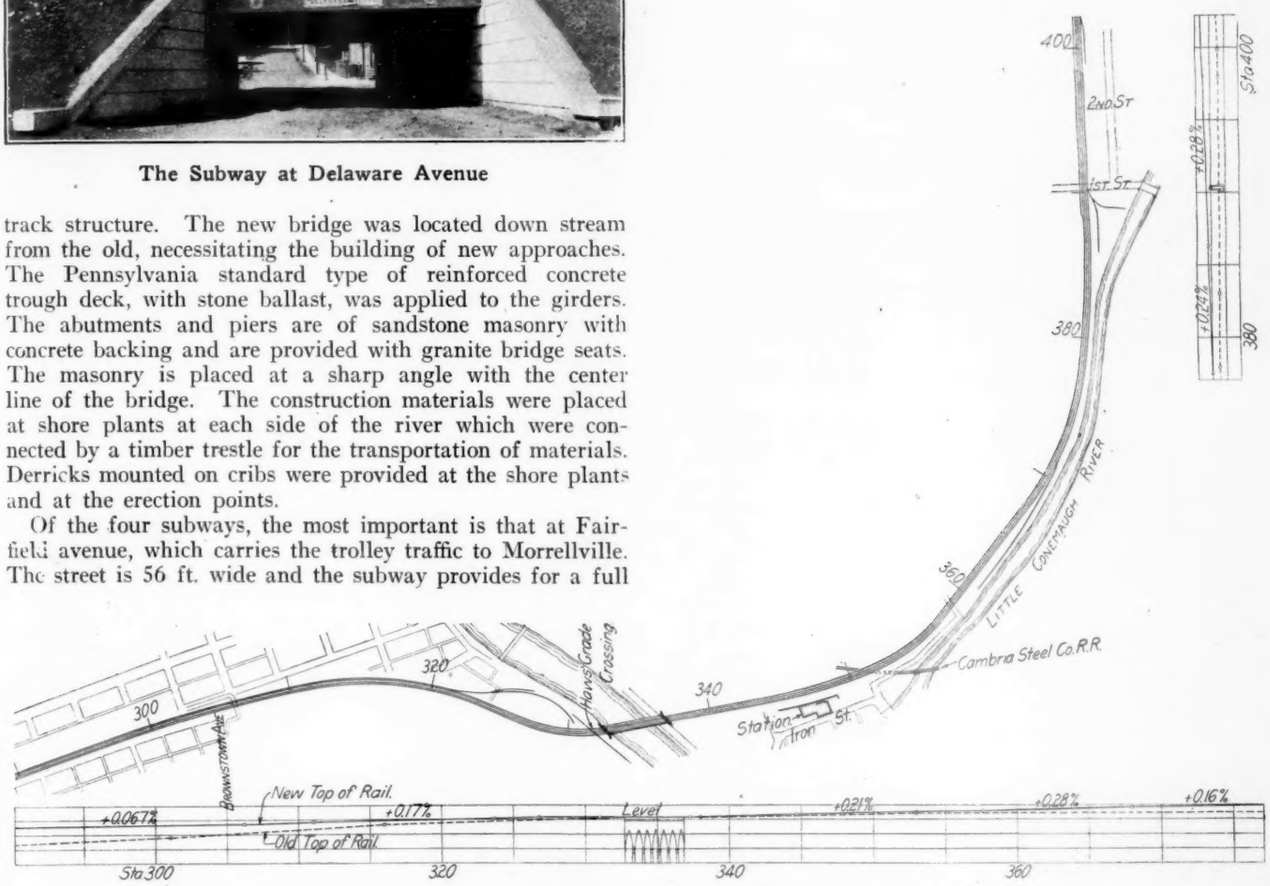
were aggravated and a specially designed approach to the six-ft. culvert under the track was built which consists of a series of concrete waterfalls and dams to catch the debris. At the last dam a grating of steel rails was placed over the entrance to the culvert to catch all waste carried over the dams.

The new Conemaugh river bridge consists of 6 97-ft. spans requiring the use of 24 9-ft. deck girders having a total weight of 1,780,000 lb. and replaces an old single

The Subway at Delaware Avenue

track structure. The new bridge was located down stream from the old, necessitating the building of new approaches. The Pennsylvania standard type of reinforced concrete trough deck, with stone ballast, was applied to the girders. The abutments and piers are of sandstone masonry with concrete backing and are provided with granite bridge seats. The masonry is placed at a sharp angle with the center line of the bridge. The construction materials were placed at shore plants at each side of the river which were connected by a timber trestle for the transportation of materials. Derricks mounted on cribs were provided at the shore plants and at the erection points.

Of the four subways, the most important is that at Fairfield avenue, which carries the trolley traffic to Morrellville. The street is 56 ft. wide and the subway provides for a full



Map and Profile of the Track Elevation

opening with intermediate supports at the curb lines, leaving an unobstructed driveway 36-ft. wide between curbs. At this point the tracks have been raised about 12 ft., and to provide a proper clearance for trolley cars, the roadway was cut down about 6 ft. below its former level, while the sidewalks were placed about 4 ft. higher to provide easier grades for pedestrians. This change in grade necessitated a relocation of B street, an unimportant road that parallels the tracks. The abutments are of the gravity type, relieved with horizontal scorings and are founded on rock. The intermediate supports are of steel encased in concrete, formed in pillar shape and relieved with paneling. The bridge is of the deck girder type with a secondary system carrying the reinforced concrete deck that is formed in the shape of a trough pitched toward the center to provide drainage.

At Laurel avenue, the Pennsylvania standard type of subway was built with mass abutments, relieved by horizontal scorings, supporting a reinforced concrete deck that was poured in place. The structure was built for 12 tracks, 10 of which have already been placed. Here the street grade was undisturbed, but the slopes of the embankments encroached on D street, making it necessary to provide a new location.

At Delaware avenue the construction is similar to the type used at Laurel. The deck slab, however, was poured outside and set in place by two 100-ton derricks. Poor foundations were encountered here and the structure is supported on Simplex piles 40 ft. long, driven in 7-ft. sections and designed to carry a load of 40 tons per pile.

As previously stated, there was an existing overhead bridge at Brownstown road. The old masonry was repaired with concrete and the north approach to the bridge sharpened to conform with the new grades. This structure is at present incomplete, as it is proposed to replace the present two-span structure with a single span through truss bridge for seven tracks.

The Easterly Section

On the section east of the Conemaugh river heavy earth work was again encountered in providing space for additional tracks. Just east of the station a side hill rock cut 300-ft. long was made by hand and small charges of explosives. The material was loaded into dump buckets which were raised by derricks placed at the top of the cut and dumped into wagons for hauling away. Just west of First street a second side hill cut 450 ft. long and 80 ft. deep was made through a similar formation. Here a traveling derrick or derrick car was used to handle the dump buckets, which were unloaded into narrow-gage cars and hauled to the waste dump. At both cuts the rock was blasted. The work at the cut near the station was further complicated by the

presence of a high tension line that was moved under service.

Commencing at the east end of the project, the first structure encountered is an overhead foot bridge at Sixth street, the approaches to which were built by the city. It is a three-span truss bridge supported on three steel bents and a concrete pier. Steel stairways with reinforced concrete steps are provided at each end.

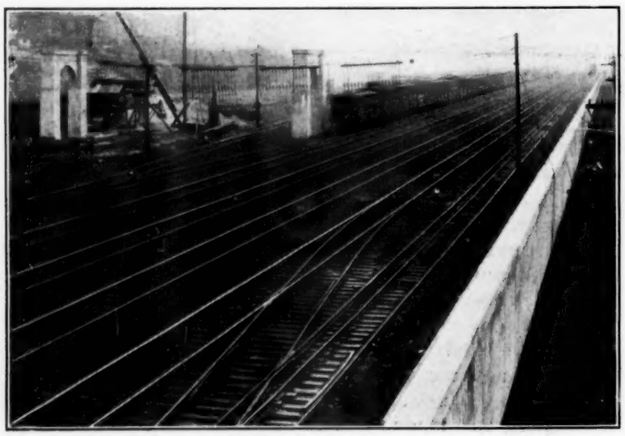
The largest bridge on this section is the new structure provided at Fourth street which replaces the old wooden bridge at Third street. This bridge consists of three through girder spans with a reinforced concrete deck and a cantilever sidewalk over the railroad and the approach spans which were built by the city. The south approach parallels the track and the concrete encased I-beam floor is carried on concrete piers. This bridge is paved with brick and is provided with boulevard lights furnished by the city.

At First street a pedestrian subway of 8-ft. span has been provided. The bench walls are of the gravity type, supporting a reinforced slab roof. Under the proposed

The Completed Bridge at Fourth Street

tracks the slabs were poured in place, while for the existing tracks they were poured outside and placed by derricks.

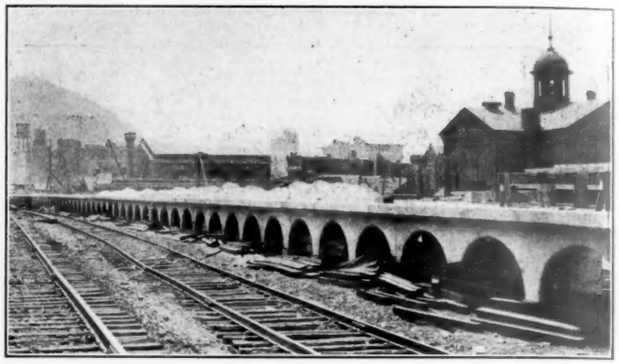
At the under crossing of the double track line of the Cambria Steel Company, which is incomplete at the present time, the tunnel type of construction has been adopted. The structure will be of concrete, reinforced throughout, and will support six Pennsylvania tracks with space underneath for the Cambria company's double-track line, and a tunnel 6 ft. wide inside, to carry a 36-in. and a 20-in. water pipe for the Cambria Steel Company. The tunnel is to be built as a part of the east abutment. The bridge is to be built on a 26-deg. 16-min. angle with the Pennsylvania tracks, and, because of this sharp skew, it presents a special con-



One of the Retaining Walls

struction problem. At present the work of placing the temporary supports for the Pennsylvania tracks and removing the old abutments is well under way and it is of interest to note that the old masonry uncovered in making the necessary excavations is in an excellent state of repair and clearly indicates the growth of the railroad as the original abutment and subsequent additions are easily identified. The original abutments were built on a timber grillage supported on timber piles, all of which were in perfect condition when uncovered. The bridge originally spanned the old Pennsylvania canal. The situation here is complicated by the presence of water lines that supply 13,000,000 gal. of water daily to the Cambria steel furnaces.

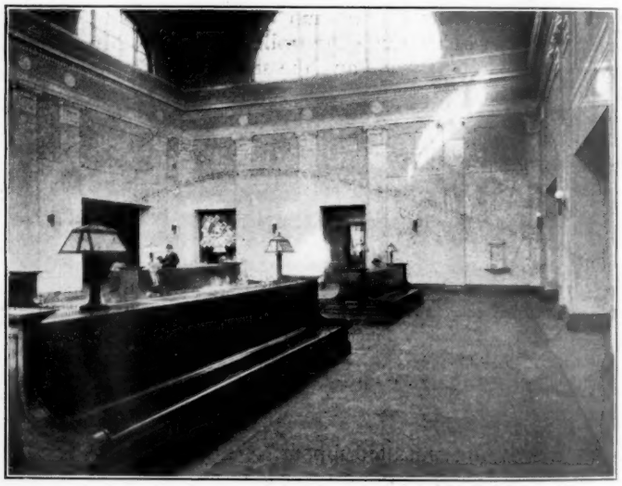
In building the retaining wall that separates the track



The East-Bound Island Platform Under Construction

level from the passenger station, the construction was delayed by the lack of proper sand. After making tests, limestone dust was substituted with such good results that in subsequent walls, even when sand was available, half sand and half dust was used. This made a dense concrete which could be rubbed to a smoother finish than when pure sand was used.

The retaining walls are conspicuously placed and special



Interior View of the Waiting Room

care was taken in their construction to secure a pleasing finish. To prevent water stains, a trough-shaped groove was placed in the under side of the coping to break the flow of the water. At the expansion joints, which, in the main, were spaced every 30 ft., the ends of each section were whitewashed before pouring adjacent sections, to prevent any bond being formed between sections. The method has been successful, as in practically every case the joints have opened up perfectly.

The New Station

The most important feature of the improvement from the civic point of view is the Johnstown station, which was built on property acquired especially for this purpose, a little west of the old station site. The building is constructed of tap-

estry brick with a granite base and Indiana limestone trim. The main building has a frontage of 90 ft. on Iron street and a depth of 98 ft. The baggage and express rooms are provided in a single story wing 97 ft. long and 50 ft. wide that flanks the main structure on the west. The wing is placed 30 ft. 5 in. back from the street line to provide space for the driveways.

The main building is constructed around a lofty court that surmounts the two-story exterior. This central court is 45 ft. by 62 ft. 6 in. in area and is entirely occupied by the waiting room. The interior of the room is finished with brick, relieved with marble pilasters and wainscoting. The vaulted ceiling, of the Guastavina type, is of special tile backed up with concrete, while the floor is terrazzo with marble borders. Light is admitted by large arched windows provided in the ends and sides of the court above the two-story exterior. The artificial lighting is both direct and indirect.

Pedestrians enter the station from Iron street by means of a portico and vestibuled entrance accentuated by columns. This entrance opens directly into the waiting room. On the east of the station a concrete-paved driveway is provided for the carriage approach. The vestibule entrance from the drive is set out by a colonnade of five columns and a marquise that serves as a porte-cochere. It opens into a small lobby that separates the ticket office located in the Iron street end of the two-story exterior and the women's room. The news-stand, smoking room and toilets are located on the track side of the central court. The remainder of the main building is occupied by a concourse 18 ft. 6 in. wide that separates the central court from the wing extension. This concourse leads directly from the street through a vestibule entrance to the passenger tunnel, providing access to trains without passing through the waiting room. Ample communication between the concourse and the waiting room and baggage room is provided. The second floor of the exterior portion of the building is given over to office use.

The stairways leading from the passenger tunnel to the isalnd platforms above are of concrete, fitted with flat type universal safety treads. The platforms are of the high type, being placed at the level of the car floor and consist of a reinforced concrete slab spanning between traverse concrete beams supported on concrete posts that in turn rest on concrete piles. The wearing surface of the platforms consists of asphalt brick laid in cement mortar. The platforms are covered with the Pennsylvania standard type two-post shelters.

As previously mentioned, the baggage and express rooms are provided in the wing of the building. The baggage room has an area of 2,300 sq. ft. An elevated platform placed at the level of a wagon floor is provided on the driveway side with a ramp connection to the main floor. The express room, which is located in the west end of the wing, has a floor area of about 2,300 sq. ft., and both rooms open into a baggage concourse leading to the baggage tunnel. Light is admitted to the concourse by means of vault lights. Baggage elevators connect the tunnel with the platforms above.

The project is being carried on under the direction of A. C. Shand, chief engineer, and under the immediate supervision of F. M. Sawyer, assistant engineer, Johnstown, Pa. A. L. Ware, resident engineer, is in charge of construction.

A New Railway for Nottinghamshire.—A new railway that passes through the greatest coal-producing section of Nottinghamshire, England, was opened to passenger traffic on April 2. It commences at Kirby by a junction with the Great Central Company's main line to London and terminates at Clipstone on that company's Chesterfield and Lincoln branch.

ADDITION TO RATE CASE HEARING*

The following is a further account of the hearing at Washington before the Interstate Commerce Commission on the proposed rate advance.

Other witnesses for southern roads were J. H. Young, president Norfolk Southern, F. W. Kirtland, assistant to vice-president, Florida East Coast, and J. B. Duke, assistant controller, Southern Railway, who introduced general statistics for the southern lines.

The southern roads completed their case except for one witness on Tuesday and were followed by the western lines.

If twenty western railways had had to pay in the calendar year 1916 the same taxes, wages and prices that they are paying now, their operating expenses and taxes would have been $126,104,000 more in that year than they actually were. There are impending additional advances in wages and prices which it is estimated will further increase the annual operating expenses of these roads by $29,800,000, making a total increase in their yearly operating expenses and taxes over those incurred in 1916 of $156,000,000. These facts were brought out by L. E. Wettling, statistician for the western roads.

If a general advance of 15 per cent in freight rates were granted, it would result, after all necessary adjustments were made, in an increase in the annual earnings of these lines, of no more than $135,000,000 or about $20,000,000 less than enough to pay the increased expenses and taxes. The railways for which these figures were compiled operate 110,000 miles out of a total of about 128,000 miles in western territory. It was shown that during the last three years the western lines have earned less than 5 per cent on the investment in their road and equipment. It was contended that, while during recent months their net operating income has not tended downward as rapidly as that of the eastern lines, this is because it had not previously increased relatively as much, and that the facts show that the need of the western lines for an increase in rates is as pressing as that of the eastern lines.

One of the largest items of increased expenses is for advances in fuel prices, which advances have already gone into effect. This amounts to $29,000,000. Wage increases already made amount to $35,000,000 a year, of which $18,250,000 is attributed to the Adamson law. The known increases in the cost of materials other than fuel aggregate $56,000,000 and the increase in taxes to over $6,000,000.

German Freight Cars and Shells.—Other things being equal, victory in a modern battle goes to the side able to dispose of the greatest volume of shells, and in this connection some figures relating to the German expenditure of munitions at Verdun are of quite extraordinary interest as showing the importance of the railway factor in warfare. It has been estimated that the weight of the shells fired by the enemy in the course of his costly failure at Verdun amounts to 1,350,000 tons, which is quite likely less than the total. This would require about 135,000 railway cars for the transport of the munitions to the firing line. It is known that in one week alone the Germans fired 3,000,000 shells north of Verdun (2,400,000 4-in. and the remainder of larger calibre), representing a total weight of 47,000 tons, and calling for the use of 240 good-sized trains. Some of these shells weighed no less than 880 lb. and were 5 ft. 6 in. long, from which it will be seen that it requires a considerable amount of rolling-stock to feed a modern big gun. To give two more examples, it may be recalled that the Germans used 37 trains of 40 cars each for the transport of the ammunition used in the taking of Hill 304, on the Meuse, while the shells poured on the Russian fortress of Ossowiecz filled 400 trains.

* The proceedings and testimony of Monday and Tuesday are reported on page 989 and following pages.

General News Department

The sixth annual convention of the Investment Bankers' Association of America will take place at Baltimore, Md., on October 1, 2 and 3, inclusive.

The Chief Interchange Car Inspectors' and Car Foremen's Association has indefinitely postponed its annual convention, which was scheduled to be held at St. Louis, Mo., from September 25 to 27, inclusive.

In South Carolina, by a law which recently went into effect, it is illegal to use for advertising purposes the kind of cross usually used as a highway crossing sign by steam and electric railroads. There is a penalty for disobedience of the law, and the supervisors of the counties are required to remove existing signs.

The Secretary of War has approved the application of the Hudson River Connecting Railroad (New York Central) for authority to build a bridge over the Hudson river near Castleton, N. Y. This proposed bridge, designed to relieve Albany city tracks of through freight trains, was described in the *Railway Age Gazette* of February 2, page 192.

Clerks in the general office of the Central of Georgia at Savannah, to the number of 70, have organized to raise garden produce on a tract of land owned by the road. The land will be divided into plots 50 ft. by 100 ft., and drawn by lot. The general work, such as plowing and the purchase of tools will be carried out by the organization, but the handwork will be done by individual workers. They will work in the early mornings and late afternoons, and on Saturday afternoons.

The Connecticut legislature has passed a law to punish trespassing more severely. It is an amendment to Chapter 202 of the acts of 1905, and punishes any person who without right is on any engine or car, or on any platform or grounds of any station or yard of any railroad, or on the track or right of way; or who rides, drives or leads any beast on such track, by a fine of $50 or imprisonment for not more than thirty days, or both. Every station agent who shall have information of a violation of the law must forthwith notify a grand juror or other informing officer of he town.

In its campaign to increase the loading of freight cars, the Canadian Pacific is issuing a series of bulletins emphasizing the fact that while the total number of freight cars in service has increased 91 per cent in the eight years from 1907 to 1915, inclusive, and the approximate capacity of these cars has increased 131 per cent, the loading has only increased from 15.4 tons to 18.4 tons; and that 48 per cent of this additional capacity provided has not been utilized. Attention is called to the fact that increasing the average loading of all cars 5 tons would be equivalent to adding 54,800 cars.

Safety Appliance Order Extended

The Interstate Commerce Commission, by an order dated April 12, has extended for eight months from July 1, 1917, the time within which freight cars must be equipped with safety appliances to conform to the standards prescribed by the commission, as set forth in its orders of March 13, 1911, and November 2, 1915.

Artistic Crossing Warnings

Marcus A. Dow, general safety agent of the New York Central Lines, which lines extend through Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Michigan, Indiana and Illinois, has issued a new warning to automobilists who neglect to take reasonable care at highway crossings. It is in the shape of a placard, in six colors, 36 in. wide and 20 in. high, which is being distributed throughout the towns adjacent to the company's lines.

Calling attention to the fact that 1,400 persons were killed at grade crossings in the United States in the last year reported—the majority of these persons being, in all probability, occupants of automobiles—he appeals to everybody to follow the simple rule to Stop, Look and Listen; do not be the next victim!

These placards are sent to all hotels and garages listed in the automobilists' "blue book" throughout the New York Central Lines' territory. Similar notices are being furnished by the road to secretaries of state, and by these officers they are sent, with annual licenses, to all owners of automobiles.

Urges Conservation of Live Stock

In an open letter to the public T. J. Foley, general manager of the Illinois Central, asks for the co-operation of farmers along railroad right of way in keeping their live stock off the tracks. Although the right of way of the Illinois Central is fenced in, farmers are careless in leaving their gates open, with the result that there have been great losses of cattle, hogs, horses and mules, which have been run down by trains. In the last five years 5,000 head of horses and mules, 16,000 head of cattle and 11,500 head of hogs have been killed on the Illinois Central tracks (equal to 125 animals a week). Mr. Foley's letter reads in part as follows:

"I appeal to every man, woman and child living along the Illinois Central lines, employee and non-employee alike, to co-operate with the railroad company in wiping out this wastage. Every person who fails to do his or her part in the saving of a single animal will be guilty of helping the country's enemies reduce the food supply to that extent; and reducing the food supply is the thing relied upon to defeat our country in the war."

The Commission to Russia

The United States Railroad Commission to the Russian government is noticed on page 1012 of this issue. As we go to press it is reported that the commissioners started from Washington for Petrograd on March 9, and that John F. Stevens, the chairman, has been appointed to the rank of Minister Plenipotentiary, and accredited to the Russian government as such. His appointment will not infringe in any way on the status of David R. Francis, the American ambassador at Petrograd.

Before leaving Washington the commission made arrangements to furnish the Russian government with a large amount of rolling stock and other material. The full personnel of the commission is said to be John F. Stevens, of New York, former chief engineer of the Panama Canal, chairman; W. L. Darling, of St. Paul, former chief engineer of the Northern Pacific; Henry Miller, of St. Louis, former operating vice-president of the Wabash; George Gibbs, electrical engineer, and J. P. Greiner, of Baltimore, late of the Baltimore & Ohio.

Committee on Coal Production

The Council of National Defense has appointed a committee on coal production to increase the output of coal at the mines, and to co-operate with the committee on raw materials, of the Advisory Commission, and with the transportation committee, in accelerating the movement of coal to points where the need is greatest. F. S. Peabody, president of the Peabody Coal Company, of Chicago, who has been designated as chairman of the committee on coal production, has turned over his business affairs to others, so that he may give his entire time to the government's service. The committee is representative of all branches of the coal business, and it will have the co-operation of the firms and corporations upon whose spirit of patriotism and co-operation the government must rely. There will be subcommittees in various parts of the country, and all operations will be conducted in harmony with the labor committee. The committee will also co-operate with mine owners and with the labor committee in minimizing the danger of strikes; and with the transportation committee in making best use of cars. Co-operation with the concerns engaged on government work and in need of immediate coal supplies will be an important branch of the committee's work.

While considerable preliminary work had already been done, the first conference of the committee was held on May 9, at Washington, for the purpose of working out a preliminary plan of co-operation whereby the government will be assured of an immediate supply of coal for all branches of the government service.

The committee consists of F. S. Peabody, E. J. Berwind, W. W. Keefer, Van H. Manning, John Mitchell, C. M. Moderwell, E. L. Pierce, Erskine Ramsey, George Otis Smith, James J. Storrow, H. M. Taylor, S. D. Warriner, J. F. Wellborn, and Daniel B. Wentz. The secretary is George W. Reed, of Chicago.

"Safety-First" for Soldiers Guarding Railways

The Baltimore & Ohio has issued to the soldiers guarding its tracks the following list of cautionary suggestions, printed on a card suitable to be carried in the pocket:

"*Keep off all tracks* except in the discharge of duty, and when stepping out of the way of approaching trains, engines or cars, go far enough to clear all running tracks.

"Where there are two or more tracks, when practicable, travel against the current of traffic; or, in other words, in the opposite direction from that in which trains are usually operated, keeping a sharp lookout, however, in both directions for approaching trains, as they may be operated in either direction as the conditions require.

"Look in both directions before stepping upon any track. Be particularly careful when crossing tracks near cars or locomotives, and when about to step from one track to another, as trains are run in either direction on any track when necessary or expedient.

"Do not attempt to crawl under a car or pass between cars separated but a short distance without knowing that proper protection against movement has been afforded. Do not step on the coupler when crossing between standing cars.

"When possible avoid walking through escaping steam.

"When coming out of buildings adjacent to tracks look in both directions before stepping upon the track.

"Do not take short cuts over dangerous places where other ways are available and known to be safe.

"Do not ride upon freight trains or locomotives unless so instructed by the proper authority.

"Do not board or alight from trains at night unless you are sure there are no obstructions or openings that may cause injury. When practicable, board or alight from the rear of the train, car or engine.

"When riding on passenger trains alight from the side intended for passengers, but do not alight while the train is in motion.

"Cultivate careful habits. By so doing one disciplines himself, and when caution becomes a habit there will be few accidents."

The Railroads Encourage Food Production

Impelled by the necessity for all possible speed in the short time remaining for spring plowing, and the shortage of farm labor, the Buffalo, Rochester & Pittsburgh has arranged for a fleet of tractors for use on farms along its lines in New York and Pennsylvania. The distribution of tractors will be under the supervision of Agricultural Agent J. M. Hawley, and they will be operated by expert tractor men. If the demand for these tractors is sufficient, it is planned to equip them with electric headlights so that they may be operated at night, after the method which has been followed in England.

The railroads of the West have joined in a special educational campaign to increase and conserve the food supply of the country. This campaign will be under the personal direction of Perry G. Holden, director of the agricultural extension department of the International Harvester Company. A trip will be made along the lines of the Union Pacific, and more than 500 meetings have been scheduled in different towns along the lines of that company. Twenty-five speakers have been obtained for lectures and talks to be given while the tour is in progress. The local authorities and civic bodies, as well as all agricultural societies, are asked to give their support to the movement by arousing the interest of the farmers in their localities.

With a view of encouraging the production of sweet potatoes, the Georgia Northern Railway has announced that it would see that ample warehouses for storing and curing the crop are provided at central shipping points along its line. The railroad also pledges its co-operation in aiding the growers to find a market.

"Raise Potatoes and Help to Win the War" is the title of a booklet which the Pennsylvania Railroad has had printed, and is about to distribute to farmers and residents in towns and suburbs along its lines.

The booklet is a condensation of a special bulletin upon potato culture issued by the department of agriculture of Pennsylvania, and sets forth the most approved method followed by scientists and practical growers in successfully producing this crop.

The purpose of issuing the booklet is explained in an introduction, which says in part:

"One of the most important military duties that will rest upon the people of the United States, in the conduct of the war, will be to produce a surplus of food. We must have enough not only to meet our own proper needs at home, but also to aid in feeding the armies and the civil populations of the countries of Europe with whom we have cast our lot. . . .

"Potatoes are, therefore, particularly adapted to meeting the emergency created by the scarcity of food resultant upon the war.

"All Americans who can should raise potatoes this summer. Every potato produced before next fall will be more effective, in the cause of the United States and the allies, than a bullet."

The booklet is being distributed through station agents, division freight agents and the freight traffic department at Broad Street station, Philadelphia.

A Lesson for Conductors

If an agent or a track foreman gives the information that there is something wrong with your train, but does not say *what* is wrong, the safe thing to do is to examine the running gear of every car. This is the lesson of an incident that occurred on the Chicago Great Western on February 20, reported in the Employees' Magazine of that road. An eastbound extra freight was passing Stillman Valley, when the agent thought he noticed a bad wheel on a car. He was "right on the job" and conveyed the proper stop signal to the train, and it was brought to a stop a short distance east. On examination the conductor and brakeman found a brake beam down under a certain car. They took it off and the train proceeded. But there was a broken wheel elsewhere in the train, almost one-third of the wheel being gone under a car of wheat. This was discovered at the next station, where the train happened to stop. Several rails were broken and others badly marked. Fortunately, nothing worse happened.

International Railway Fuel Association

The International Railway Fuel Association intends to hold its annual meeting at Chicago this year as usual, May 14 to 17, 1917. The association considered the advisability of postponing its meeting because of war conditions, but decided, in view of the large increases in the price of coal, difficulty that mine operators might experience in producing adequate supply of coal because of labor shortage, and the consequent necessity of using coal more economically during the coming year than ever before, it was to the very best interests of the railroads, mine operators and consumers of coal that the work of the association be prosecuted during the coming year more vigorously than at any time in the past.

Among the papers to be read and discussed at the meeting will be Storage of Coal; Locomotive Feed Water Heating, and Fuel Tests. President W. H. Averell, of the association, has issued an appeal to operating vice-presidents and general managers, asking them to encourage the attendance of transportation officers, especially division superintendents and trainmasters.

American Electric Railway Association

In view of the crisis which the nation is now facing the executive committee of the American Electric Railway Association feels that the form to be taken by the annual convention should this year be materially changed. It has, therefore, adopted resolutions as follows: "Be it resolved, by the executive committee of the American Electric Railway Association, that the conven-

tion and exhibit of the association, in its usual form, be abandoned for the year 1917, and that the committee communicate to the member companies, at a later date, the call for such meeting as may at the time seem proper to substitute; and be it further resolved, that the executive committee in behalf of the Association, pledges anew its patriotic support to the nation, and accepts in behalf of its member companies the trust imposed upon the transportation agencies of the country, by the president, insofar as it applies to electric railways.

Exhibitors at the Air Brake Convention

The following is a list of exhibitors and their representatives at the convention of the Air Brake Association, which was held at Hotel Chisca, Memphis, Tenn., May 1-4:

Ashton Valve Company, Boston, Mass.—Gages, gage testers and safety valves. Represented by J. F. Gettrust.

Barco Brass & Joint Company, Chicago.—Barco flexible connection for engine and tender. Represented by C. Thomas.

Byers Company, A. M., Pittsburgh, Pa.—Wrought iron pipe. Represented by H. P. Broome and H. F. Bilger, Jr.

Chicago Railway Equipment Company, Chicago.—Creco clasp brake, brake beams, third and fourth point support. Represented by E. G. Busse.

Detroit Lubricator Company, Detroit, Mich.—Lubricators and flange oiler. Represented by A. G. Machesney.

Dixon Crucible Company, Joseph, Jersey City, N. J.—Graphite and graphite products for railroad service. Represented by L. H. Snyder and H. L. Hewson.

Edna Brass Manufacturing Company, Cincinnati, Ohio.—Injectors, lubricators, checks and valves, coal sprinklers, fire extinguishers, brass castings. Represented by E. O. Corey and Robt. Livingston.

Garlock Packing Company, Palmyra, N. Y.—Air brake gaskets, air pump and spiral packing. Represented by J. S. Hearons.

Johns-Manville Company, H. W., New York.—Air pump throttle and brake cylinder packing, expander rings and slack adjuster. Represented by J. E. Meek, J. H. Trent, E. A. Willard and G. Christenson.

Leslie Company, The, Lyndhurst, N. J.—Steam heat regulators and removable injector coupling nuts. Represented by S. I. Leslie and J. J. Cizek.

New York Air Brake Company, New York.—Type P. S. passenger car brake, type J slide valve feed valve, safety valves, signal car discharge valve, air pump strainer. Represented by H. F. Dickel, N. A. Campbell, L. W. Sawyer, W. J. Elliot, B. Hyanes and J. A. Hicks.

New York & New Jersey Lubricant Company, New York.—Non-fluid oil brake cylinder and triple valve lubricants. Represented by J. H. Bennis and H. H. Ashmore.

New York Belting & Packing Company, New York.—Pneumatic, steam and hot water hose, gaskets and belting. Represented by L. F. Purtill.

Simmons-Boardman Publishing Company, New York.—*Railway Age Gazette* and Railway Mechanical Engineer. Represented by A. F. Stuebing.

Vapor Car Heating Company, Chicago.—Steam hose couplings and steam heat devices. Represented by F. F. Coggin, R. P. Cooley and L. Rhodes.

Westinghouse Air Brake Company, Pittsburgh, Pa.—Triple valve testing rack, No. 6-A ET distributing valve, No. 6 ET reelase pipe valve, No. 54 air strainer, spring type pressure retaining valve, special branch pipe tees, air valve lift gage, and brake valve handle stop. Represented by Walter V. Turner, J. B. Wright, F. H. Parke, T. W. Newburn, R. I. Cunningham, A. L. Berghane, C. D. King, L. Willcox, G. B. Pierce, F. M. Nellis, E. H. Dewson, E. G. Desoe, H. H. Burns, J. C. Kuhnert, W. E. Dean, Jr., F. B. Johnson, C. H. Larimer and E. A. Maylock.

American Railway Accounting Officers

The executive committee has postponed (to a date to be fixed later) the meeting of the Association of American Railway Accounting Officers scheduled to be held in Richmond, Va., May 30, 1917. This action is taken in view of the existing condition of national affairs, and the desire of the railroads to render every possible service to the government without delay.

Master Boiler Makers' Association

At a meeting of the executive board in Chicago on Wednesday, May 2, it was decided, on account of war conditions, to postpone indefinitely the eleventh annual convention of the Master Boiler Makers' Association, which was to have been held May 22 to 25 at the Jefferson Hotel, Richmond, Va.

Transportation and Car Accounting Officers

G. P. Conard, 75 Church street, New York, secretary of the Association of Transportation and Car Accounting Officers, announces that by a decision of the executive committee the meeting of the association, which was scheduled to be held at Detroit, Mich., June 26 and 27, has been postponed indefinitely.

Former New York Central Signal Men

The former employees of the New York Central Railroad Signal Department will hold their fifth annual luncheon on Tuesday, June 12, the first day of the R. S. A. meeting.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 8-10, Minneapolis, Minn.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 26-29, Hotel Traymore, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, May 21-24, Cincinnati, Ohio.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, Chicago, Ill.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May 14-17, Hotel Sherman, Chicago.

INVESTMENT BANKERS' ASSOCIATION.—Frederick R. Fenton, 111 W. Monroe St., Chicago. Annual convention October 1-3, 1917, Baltimore, Md.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August. Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Annual meeting, May 9-11, Louisville, Ky.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, June 12-13, Hotel McAlpin, N. Y.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, Fresno, Cal.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The Long Island road has announced increased rates on ten-ride, twenty-ride and fifty-ride tickets, except for trips wholly within the limits of New York City.

The railroads of Illinois on May 9 applied to the State Public Utilities Commission for authority to make general increase of 15 per cent in freight rates.

The railroads of Ohio have filed with the Public Utilities Commission of that state tariffs providing for a general increase of 15 per cent in freight rates, and with arbitrary increases on coal, following the general rule adopted in connection with interstate rates.

The railroads of Virginia have applied to the State Corporation Commission for authority to make a general increase in freight rates of 15 per cent. The roads running north and south ask for certain other readjustments.

The railroads of Kentucky have filed with the State Railroad Commission a petition for authority to make a general advance in freight rates of 15 per cent, with arbitrary increases on coal.

The New York State Public Service Commission, Second district, has accepted from the railroads freight tariffs proposing a general increase in rates of 15 per cent, on the same basis as the proposed increase in interstate rates; and the commission announces that probably it will take no action in the matter until interstate rates have been settled.

Supplement No. 4 to Southern classification No. 43, with exceptions, was issued on April 26, to become effective June 15, 1917.

The New York Central has discontinued the use of the Grand Trunk passenger street station at Brush street, Detroit, and the Woodward avenue station in the same city, and is now running its Detroit trains to and from the Michigan Central passenger station on Fifteenth street.

The Central of Georgia has appropriated $9,000 for prizes to be given this year to members of boys' clubs on farms in the sixty counties of Georgia through which the railroad runs. The prizes are for industry, intelligence and care in raising calves and in cultivating cotton, corn and oats.

A hearing on reconsignment and diversion charges proposed by the railroads began at Chicago on May 7 before C. V. Burnside, examining attorney of the Interstate Commerce Commission. The rates proposed are $2 a car for diversion and $5 a car for reconsignment, to apply to all commodities.

The Erie Railroad has announced that at the beginning of next week 77 passenger trains will be withdrawn from service, with a view to providing more engines and men to run freight trains. Most or all of the trains to be taken off are those running in local or suburban service in the state of New Jersey; and the Public Utility commissioners of that state have ordered the railroad company to appear before the board and show cause for the proposed diminution of service.

Hazen J. Titus, superintendent of dining cars of the Northern Pacific, who made the "Great Big Baked Potato" a feature of dining car service on his road, has responded to President Wilson's appeal for economy in the consumption of food. In a recent announcement he says: "The Northern Pacific has deemed it wise to discontinue the serving of the Great Big Baked Potato in its dining cars during the term of the war, so that there shall be no waste through a passenger being served with more than he can eat of a single item."

Erie Canal

The Erie Canal is approaching its hundredth birthday. Financial preparations for the building of the canal were begun on April 17, 1817, and the work of construction was begun on July 4 of that year. The canal was finished on October 25, 1825.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Rates from Ohio Points to the Southeast

Traffic Bureau of the Toledo Commerce Club et al. v. Cincinnati, Hamilton & Dayton et al. Opinion by Commissioner Meyer:

Class rates governed by official classification, from Toledo, Cleveland, Springfield, Canton, Dayton and Columbus, Ohio, Detroit, Mich., and contiguous territory, to points in the southeast, are not found unreasonable.

It is held, however, that the present relation between class rates from this territory and class and certain commodity rates from Chicago and Peoria, Ill.; Milwaukee, Wis., and points from which rates to the southeast are made by the use of proportional rates to the Ohio river crossings, Cairo to Cincinnati, results in undue preference to the cities and territory from which the proportional rates apply and subjects complainants, and the localities of Toledo, Cleveland, Springfield, Canton, Dayton, Columbus and Detroit and contiguous territory to prejudice and disadvantage. (43 I. C. C., 446.)

STATE COMMISSIONS

The Public Utilities Commission of New Jersey, reporting on complaints against the Erie Railroad, finds that a train leaving Jersey City at 5:14 p. m. for Westwood, 21 miles out, is habitually late, as averred; and that the main cause is that one division over which this train runs has but one main track. If the company cannot do better the commission "may find it necessary to order it to provide a double track." The company claimed that some delays were due to the poor quality of coal used, better coal being now unobtainable; but the only answer of the commission is an order requiring the company to report delays more carefully and in full detail. Poor light in passenger cars was complained of; and in response to the company's statement that it was substituting better lights, the commission ordered a report made to it every two months showing the number of new lamps put into cars in place of old ones.

PERSONNEL OF COMMISSIONS

William L. O'Connell, chairman of the Illinois State Public Utilities Commission, has resigned, and will be succeeded by Thomas E. Dempcy, of East St. Louis.

COURT NEWS

Waiver of Notice of Damage to Live Stock

The Colorado Supreme Court holds that where a contract covering an interstate shipment of livestock requires the shipper to give written notice of damage before the stock shall have been taken away, such stipulation cannot be waived, except by a general officer of the railroad, as provided by the stipulation itself.—Atchison, T. & S. F. v. Miller (Colo.), 163 Pac., 836. Decided March 5, 1917.

Jurisdiction as to Flagmen at Crossings

The New Jersey Court of Errors and Appeals holds that under the state public utilities act the State Supreme Court is given jurisdiction to review the orders of the board of public utility commissioners and to set aside and affirm the orders in toto, but the Supreme Court has no power under the act either to revise or modify an order of the board.—The Supreme Court (87, N. J. Law, 438, 95 Atl., 177) set aside an order by the board requiring that the Erie keep a flagman at certain grade crossings on its Newark branch at periods of time when there are no regular trains running; and, in addition to setting aside the order, directed that part of the order be modified by providing that the railroad be required to keep a flagman on duty at the crossings designated only during such hours as trains are

operated over them. The Court of Errors and Appeals holds that what order shall be made in lieu of the one set aside rests exclusively within the jurisdiction of the board of public utility commissioners.—Erie v. Board (N. J.), 100 Atl., 346. Decided March 5, 1917.

Free Passes to Officers of Other Roads

The Indiana Supreme Court holds that a pass issued by a railroad to an officer of another railroad, in exchange for passes issued by his road to officers of the first mentioned railroad as authorized by the Indiana statute, is a free pass or gratuity, so that a provision therein that he should assume risk of accident is binding, preventing recovery for his death while riding thereon, unless caused willfully.—Ft. Wayne & W. v. T. Co. (Ind.), 115 N. E., 583. Decided March 28, 1917.

Double Taxation

The Illinois Supreme Court holds that section 31, authorizing the commission to approve the issuance of stock by a public service corporation and requiring the corporation to pay into the state treasury an amount equal to 10 cents on each $100 of the stock so issued, repealed the requirement of the Illinois Incorporation Fee Act that on filing articles of incorporation the corporation should pay to the secretary of state a fee equal in amount, in so far as the latter provisions applied to a consolidated railroad corporation, since the fees are both to be paid into the state treasury, are the same in amount and for the same privilege to issue capital, and there is nothing in the statute which indicates an intention of the legislature to impose a double taxation on that privilege.—New York Central v. Stevenson (Ill.), 115 N. E., 633. Decided February 21, 1917. Rehearing denied April 6, 1917.

Crossing Accident—Automobile Passenger's Duty

A husband and wife, riding in an automobile, the husband driving and the wife sitting beside him on the front seat, were killed by a train at a crossing in a village. The day was clear and both were familiar with the crossing. The train was late and running at 50 miles an hour. The automobile was moving at about 6 miles an hour. At a point 90 to 100 feet from the track a view of it could be had for a distance of from 800 to 1,100 feet towards the west, the direction from which the train came, and the distance visible increased with the approach to the track. At a point 40 feet or more from the track there was a clear view of it in both directions for an indefinite distance. In an action for the death of the wife it was held that the driver of the automobile was guilty of contributory negligence. The court conceded that the negligence of the driver could not be imputed to his wife, but the fact remained that she, seated beside her husband on the front seat, and with the same knowledge of the approach to the crossing and the danger thereof, was as much under the duty of lookout and discovery as he was. Judgment for the defendant was affirmed.—Beemer v. Rock Island (Iowa), 162 N. W., 43. Decided April 3, 1917.

Storage Charges for Travelers' Baggage

A traveling salesman complained to the Missouri public service commission that the regulations of the railroads for the storage of baggage at destination were unjust. Baggage was held free when received at any hour Saturday and claimed before the same hour Monday, or when received at any hour Sunday and claimed before midnight the Monday following. It was objected that merchants were not able to examine samples on Saturday, and that a longer time should be allowed free for baggage arriving on Friday, and not to be removed until Monday. The commission made an order to give effect to the salesmen's request and the railroads affected appealed. The Missouri Supreme Court holds that the order was unfair, unreasonable, and void. Its mere generality did not authorize its sustentation. The order was made solely "to meet the objections urged by the traveling salesmen, and not upon complaint by the public, and its effect was to give traveling salesmen a special exemption not enjoyed by other travelers. It was also discriminatory as against interstate travelers, who must comply with the usual regulation in use for many years in the United States without objection on the part of the general public. The order was therefore vacated.—Atchison T. & S. F. v. Public Service Commission (Mo.), 192 S. W. 460. Decided February 13, 1917.

UNITED STATES SUPREME COURT

Stipulation for Written Notice of Damage to Freight Held Reasonable and Not Complied With

The Supreme Court of the United States holds that verbal notice to a carrier's agent of the damaged condition of an interstate shipment of perishable goods is not a compliance with a stipulation requiring written notice of intention to claim damages.

The case concerned a shipment of peaches from Arkansas to New York. The bill of lading required "claims for damages to be reported by consignee, in writing to the delivering line" within 36 hours after notification of arrival; otherwise none of the carriers would be liable.

The court said that "it is not difficult for the consignee to comply with a requirement of this kind. Such notice puts in permanent form the evidence of an intention to claim damages. * * *" No attempt was made to give such notice, although the fact that the peaches were greatly depreciated was known to the consignee very shortly after arrival. There was testimony tending to show that it would take more than 36 hours to separate the good peaches from the bad; but the court pointed out that the only requirement was that claims must be "reported" in writing; not that a specific claim must be filed within 36 hours. The court found nothing unreasonable in the stipulation, and held that the Supreme Court of Arkansas erred in holding that verbal notice to the delivering carrier's dockmaster was a compliance with the terms of the contract.

This case arose before the passage of the Cummins Amendment of March 4, 1915.—St. L., I. M. & S. v. Starbird. Decided April 30, 1917.

Necessity for Automatic Couplers

In an action by a switchman for injuries the following were the essential facts: A string of many cars was separated by about 80 ft. from five cars on the same track loaded with coal. An engine, pushing a stock car ahead of it, came into this track and failed in an attempt to couple to the five cars, but struck them and caused them to run violently against the standing train; and the plaintiff, who was on one of the five cars for the purpose of releasing the brakes, was thrown to the track and injured. The negligence alleged was that the railroad, engaged in interstate commerce, had failed to have the cars equipped with automatic couplers, as required by the safety appliance act. The defense was that the act was not applicable, because it was intended only for the benefit of employees injured when between cars for the purpose of coupling or uncoupling them. This claim was based wholly upon the expression "without the necessity of men going between the ends of cars," following the automatic coupler requirement of section 2 of the act of 1893. The jury in the state court found that the railroad was liable because the cars were not properly equipped with automatic couplers, and the Supreme Court of the United States has now affirmed a judgment for the plaintiff.

The court said: "While it is undoubtedly true that the immediate occasion for passing the laws requiring automatic couplers was the great number of deaths and injuries caused to employees who were obliged to go between the cars to couple and uncouple them, yet these laws as written are by no means confined in their terms to the protection of employees only when so engaged. The language of the acts makes it entirely clear that the liability in damages to employees for failure to comply with the law springs from its being made unlawful to use cars not equipped as required—not from the position the employee may be in or the work which he may be doing at the moment when he is injured. This effect can be given to the acts and their wise and humane purpose can be accomplished only by holding, as we do, that carriers are liable to employees in damages whenever the failure to obey these safety appliance laws is the proximate cause of injury to them when engaged in the discharge of duty. The jury found that the plaintiff's case came within this interpretation of the statute and the judgment of the Supreme Court of Georgia must be affirmed."—L. & N. v. Layton. Decided April 30, 1917.

Railway Officers

Executive, Financial, Legal and Accounting

William T. Kemper, receiver of the Kansas City, Mexico & Orient of Texas, has been elected president, succeeding E. Dickinson, resigned. Lawrence V. Guild, assistant to the president, has been appointed assistant to the receiver, with headquarters at Kansas City, Mo.

Kenneth F. Burgess, attorney for the Chicago, Burlington & Quincy at Chicago, Ill., has been appointed general attorney for that system, with the same headquarters. He was born at Oshkosh, Wis., on October 16, 1887, and graduated from the University of Wisconsin in 1910, where he received the degrees of A.B. and LL.B. He practiced law at Madison, Wis., and at Lancaster until 1915, when he entered the legal department of the Burlington at Chicago, since which time he has acted as attorney for this company. He succeeds Robert Bruce Scott, promoted to general solicitor.

K. F. Burgess

F. B. Townsend, traffic manager of the Minneapolis & St. Louis at Minneapolis, Minn., has been elected vice-president in charge of traffic; F. M. Miner, general attorney at Minneapolis, has been appointed general counsel, succeeding W. H. Bremner.

Robert Bruce Scott, announcement of whose appointment as general solicitor of the Chicago, Burlington & Quincy, with office at Chicago, Ill., was made in these columns last week, was born at Kaneville, Ill., March 18, 1874. After a preliminary education he entered the University of Wisconsin, and then took courses in the University of Pennsylvania, the University of Chicago and the University of Berlin, Germany. He began private legal practice at Aurora, Ill., in 1897, and in 1900 was appointed local attorney for the Chicago, Burlington & Quincy, in which capacity he continued to serve until 1905. In 1906 he was appointed a member of the faculty of the University of Wisconsin, resigning as professor of law in 1911 to become general attorney of the Chicago, Burlington & Quincy, giving special attention to Interstate Commerce matters. He now becomes general solicitor for the entire system, with headquarters at Chicago, a newly created position.

R. B. Scott

Edmund Pennington, president of the Minneapolis, St. Paul & Sault Ste. Marie, has also been elected president of the Spokane & International, succeeding L. C. Corbin. Edgar S. McPherson, assistant secretary of the Soo Line, has been appointed manager of the Spokane & International, with office at Spokane, Wash.

W. L. Markley, auditor of the New York, Philadelphia & Norfolk, has been appointed to the newly created position of auditor of departmental accounts of the Pennsylvania Railroad, and H. W. Siegrist, auditor of the Cornwall & Lebanon, has been appointed assistant auditor of departmental accounts of the Pennsylvania Railroad.

A. R. Whaley, vice-president in charge of operation of the New York, New Haven & Hartford at New York since February, 1913, has announced that he will retire on May 31. Mr. Whaley's duties will be assumed by other officers of the company. Mr. Whaley will retain a connection with the company and continue to handle various matters which, through his long experience and wide knowledge, will be of service to the company.

William Hepburn Bremner, acting president of the Minneapolis & St. Louis at Minneapolis, Minn., has been elected president. He was born at Marshalltown, Ia., on October 24, 1869, and graduated from the University of Iowa, in 1891, with the degree of civil engineer, and in 1895 with the degree of LL. D. He practiced law in Des Moines, Ia., for several years, and in 1902 was made city solicitor, remaining in that position for six years. In 1909 he was appointed general attorney of the Minneapolis & St. Louis, with headquarters at Minneapolis. Three years later he was appointed general solicitor, and in 1916 was appointed general counsel. Early in April, 1917, he was appointed acting president of the same road, succeeding E. L. Brown, who resigned on account of ill health.

Operating

J. L. Hayes, division superintendent of the Pere Marquette at Saginaw, Mich., has been appointed general superintendent, with headquarters at Detroit.

A. L. Haldeman, acting superintendent of the Chicago, Rock Island & Pacific at Estherville, Iowa, has been appointed superintendent at that point.

Joseph Pierce Quilty, manager of mail, express and milk traffic of the Boston & Maine at Boston, Mass., has been appointed superintendent of the Terminal division at Boston, Mass., succeeding George H. Folger. Mr. Quilty was born on October 10, 1867, at Richibucto, New Brunswick. He began railway work in March, 1879, with the Intercolonial Railway of Canada, and served as telegrapher and agent on that road until July, 1886. He then went to the Boston & Maine in the same capacity, and in August, 1900, became general agent at Cambridge, Mass. In March, 1909, he was appointed freight tariff examiner at Boston, and in October, 1910, he was appointed chief of the freight rate bureau at the same place. On January 1, 1914, he was appointed superintendent of station service at Boston, remaining in this position until January, 1917, when he became manager of mail, express and milk traffic, and now becomes superintendent of the Terminal division at Boston of the same road, as above noted.

J. P. Quilty

C. F. Seymour has been appointed assistant superintendent of the Denver & Rio Grande at Salt Lake City, Utah, succeeding D. E. Wilcox, transferred.

George H. Folger, division superintendent of the Boston & Maine at Boston, Mass., has been appointed assistant general superintendent, with office at North Station, Boston.

A. L. Grandy, chief engineer of the Pere Marquette, with office at Detroit, Mich., has been appointed assistant general manager, with the same headquarters. Mr. Grandy was appointed chief

engineer of this company in January, 1913, prior to which he had been division engineer, Saginaw, Mich.

Traffic

E. S. Briggs has been appointed traffic manager of the Pacific Fruit Express Company, with headquarters at San Francisco, Cal.

O. A. Toole has been appointed commercial agent of the Georgia Southern & Florida, with office at Valdosta, Ga. H. L. Peters transferred.

J. A. Werne, New England freight agent of the Southern Railway System at Boston, Mass., has been appointed general freight agent, with office at Memphis, Tenn., vice W. A. Turner, transferred.

William W. Neff has been appointed general freight and passenger agent of the Wisconsin & Northern, with headquarters at Oshkosh, Wis. Harry Peterson has been appointed industrial commissioner.

O. L. Kinney, district passenger agent of the Pere Marquette at Toledo, Ohio, has been appointed general western passenger agent, with headquarters at Chicago, Ill., succeeding H. J. Gray, resigned to engage in other business. J. K. Cooper, city passenger and ticket agent at Grand Rapids, Mich., has been appointed district passenger agent at Toledo, succeeding O. L. Kinney, promoted.

Tom Hood, city passenger and ticket agent of the Southern Pacific, Texas Lines, at Houston, Tex., has been appointed division passenger agent, with the same headquarters. E. McClannahan, city passenger and ticket agent at San Antonio, Tex., has been appointed division passenger agent, with same headquarters. R. E. George, traveling passenger agent at San Antonio, has been appointed division passenger agent at Waco, Tex.

John B. Payne, general freight agent of the Texas & Pacific, at Dallas, Tex., has been appointed assistant freight traffic manager, with office at New Orleans, La. He was born at Bowling Green, Ky., in 1872, and entered railway service in a clerical capacity in 1889 with the Atchison, Topeka & Santa Fe at Topeka, Kan. After a short service with the Mexican Central he returned to the United States to become a stenographer in the office of the general freight agent of the Texas & Pacific, at Dallas, Tex. Subsequently, he was consecutively rate clerk, commercial agent at Ft. Worth, Tex.; commercial agent at Louisville, Ky., commercial agent at Birmingham, Ala.; commercial agent at Chicago, Ill., and chief clerk to the general traffic manager at New Orleans, La. In December, 1912, he was appointed assistant general freight agent at New Orleans, and in January, 1913, was transferred to Dallas. On May 15, 1916, he was promoted to general freight agent at Dallas, and continued in that position up to the time of his promotion, as noted above. He succeeds Frank Koch, resigned, to go with another company.

J. B. Payne

J. W. Hunter, general freight agent of the Southern Railway at Birmingham, Ala., has been appointed general freight agent at Atlanta, Ga. R. L. Simpson, general freight agent at Atlanta, has been appointed general freight agent at Washington, D. C.; J. W. Bray, commercial agent at Knoxville, Tenn., has been appointed New England freight agent, with office at Boston, Mass., vice J. A. Werne, promoted, and F. L. Word, live stock agent at Atlanta, Ga., in addition to his present duties, has been appointed assistant to E. C. Gatewood, general agent, at Rectortown, Va.

E. C. Morgan, commercial agent of the Southern Railway system at Pittsburgh, Pa., has been appointed district freight agent, with office at Pittsburgh; Paul A. Wright, commercial agent at Birmingham, Ala., has been appointed district freight agent, with office at Birmingham; G. W. Benus, commercial agent at Cincinnati, Ohio, has been appointed district freight agent at the same place; and W. H. Timberlake, commercial agent at Birmingham, Ala., has been transferred as commercial agent to Cincinnati.

B. M. Flippin has been appointed assistant freight traffic manager of the Missouri Pacific-St. Louis, Iron Mountain & Southern, with headquarters at New Orleans, La., as was announced in these columns two weeks ago. For several years he was connected with the Mobile & Ohio in various traffic and operating capacities. He was joint general export agent of the above company and the Southern at Mobile, Ala., and at the same time was manager of the Mobile Docks Company. From 1906 to 1907 he was assistant freight traffic manager of the Missouri Pacific at St. Louis, Mo., and later was promoted to freight traffic manager of the same company. In 1913 he became associated with the J. H. W. Steele Company, foreign freight and forwarding agents, as manager at Savannah, Ga., being made traffic manager for the same company with headquarters at Galveston, Texas, in May, 1915. On May 15, 1916, he was appointed general traffic manager of the Texas & Pacific, with headquarters at New Orleans, which position he continued to fill up to the time of his appointment, as noted above.

B. M. Flippin

Engineering and Rolling Stock

A. C. Clarke has been appointed assistant engineer of surveys of the Baltimore & Ohio, with office at Baltimore, Md.

W. G. Hall has been appointed shop superintendent of the International & Great Northern, with office at Palestine, Texas, vice W. A. Brule, promoted.

W. Wells has been appointed division master mechanic of the Sudbury division of the Canadian Pacific, with headquarters at Sudbury, Ont., vice T. Hambly, transferred.

L. G. Harris acting division engineer of the Atchison, Topeka & Santa Fe at La Junta, Colo., has been appointed division engineer, with office at San Marcial, New Mex., succeeding W. J. Lank, resigned.

Job Tuthill, of the engineering department of the Michigan Central, with office at Detroit, Mich., has been appointed chief engineer of the Pere Marquette at Detroit, succeeding A. L. Grandy, promoted.

F. L. Beal, superintendent and valuation engineer of the Louisiana & Arkansas, with office at Stamps, Ark., has been appointed chief engineer with the same headquarters, succeeding W. H. Vance, who has resigned to go with another company.

W. J. Bennett, master mechanic of the Utah lines of the Denver & Rio Grande at Salt Lake City, Utah, has been appointed assistant superintendent of the motive power and car departments, with headquarters at Denver, Colo., and E. J. Harris, superintendent of shops at Salt Lake City, has been appointed master mechanic of the Utah lines, with headquarters at Salt Lake City, vice Mr. Bennett.

D. M. Perrine, superintendent of motive power of the Pennsylvania Railroad at New York, has been promoted to the personal staff of the general superintendent of the New Jersey division, and H. H. Maxfield, superintendent of motive power of

the Western Pennsylvania division, has been appointed superintendent of motive power of the New Jersey division to succeed Mr. Perrine; J. L. Cunningham, master mechanic of the Philadelphia division at Harrisburg, Pa., has been promoted to superintendent of motive power of the Western Pennsylvania division, and C. L. McIlvaine, master mechanic of the New York, Philadelphia & Norfolk at Cape Charles, Va., has been appointed master mechanic of the Philadelphia division to succeed Mr. Cunningham; James Milliken, superintendent of motive power at Wilmington, Del., has been promoted to special engineer in the office of the general superintendent of motive power of the Lines East of Pittsburgh and Erie; and C. D. Young, engineer of tests at Altoona shops, has been promoted to superintendent of motive power at Wilmington to succeed Mr. Milliken.

The following appointments and changes in the organization and location of division engineers on the Erie became effective on May 1: O. F. Barnes, division engineer at Jersey City, N. J., in charge of the New York division and side lines, the New York, Susquehanna & Western and the Wilkes-Barre & Eastern; R. H. Boykin has been transferred from Marion, Ohio, to Susquehanna, Pa., in charge of the Delaware and Wyoming divisions and branches; R. L. Dyke has been transferred from the New York, Susquehanna & Western at Jersey City, N. J., to Elmira, N. Y., in charge of the Susquehanna, Rochester and Tioga divisions and the Bath & Hammondsport Railroad; F. S. Wheeler, at Buffalo, is in charge of the Buffalo division and branches, Allegheny division and Bradford division; F. D. Lakin has been transferred from Huntington, Ind., to Meadville, Pa., in charge of the Meadville division and branches; I. H. Schram has been transferred from Susquehanna, Pa., to Youngstown, Ohio, in charge of Mahoning division and branches; H. S. Elliott has been transferred from Hornell, N. Y., to Marion, O., in charge of the Kent division, First and Second districts, and J. R. Sexton has been transferred from Meadville, Pa., to Huntington, Ind., in charge of the Marion division, First and Second districts, and the Chicago division.

Purchasing

W. A. Summerhays, whose appointment as assistant purchasing agent of the Illinois Central and the Yazoo & Mississippi Valley with headquarters at Chicago, has already been announced in these columns, was educated in the Chicago public schools and the University of Illinois. In June, 1898, he entered the service of the Illinois Central as an engineering apprentice assigned to track work, and in 1900 he became section foreman. The following year he was appointed general foreman of construction and later in the same year became assistant general storekeeper. In May, 1910, he was appointed general storekeeper of the same road, which position he held at the time of his recent appointment as assistant purchasing agent.

W. A. Summerhays

Railway Officers in Military Service

Charles W. Breed, office engineer of the Chicago, Burlington & Quincy, at Chicago, has been appointed captain in the Engineer Officers' Reserve Corps of the U. S. Army.

W. G. Arn, assistant engineer maintenance of way of the Illinois Central at Chicago, has been appointed captain adjutant Engineer Officers' Reserve Corps of the U. S. Army.

Charles L. Bent, inspector of passenger train and station service of the Illinois Central, with office at Chicago, has been appointed major in the Engineer Officers' Reserve Corps of the U. S. Army.

OBITUARY

Joseph Frank McDoel, joint commercial agent of the Chicago, Indianapolis & Louisville and the Michigan Central, died at his home in Lafayette, Ind., April 30, age 80 years. He was a brother of William Henry McDoel, for many years president of the Monon.

Albert E. Manchester, general superintendent of motive power, Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., died at his home in that city May 4, age 70 years. He was born February 12, 1847, at Beaver Dam, Wis., and entered railway service in 1864 as an apprentice in the mechanical department of the Chicago, Milwaukee & St. Paul. Consecutively he was for five years a machinist at Milwaukee, for 17 years a roundhouse foreman at various points along the line, for two years general foreman of the locomotive department, and for four years division master mechanic for the southwest district, including both car and locomotive departments. On April 1, 1893, he was appointed assistant superintendent of motive power for this company, and on June 15, 1901, was promoted to superintendent of motive power, with jurisdiction over the entire system. In recognition of his long and faithful service, extending over a period of more than 50 years, he was recently promoted to general superintendent of motive power.

A. E. Manchester

James Robert Wood, formerly for 32 years at the head of the passenger department of the Pennsylvania Railroad, who retired in March, 1913, died on May 3 at Atlantic City, N. J. Mr. Wood was born at Auburn, N. Y., on February 9, 1843, and began railway work in 1869 as secretary to the superintendent at Creston, Iowa, of the Burlington & Missouri River, now a part of the Chicago, Burlington & Quincy. From this position he was advanced to trainmaster, which he held until 1871, when he was appointed general western passenger agent of the same road, with office at Chicago. In 1873 he became general ticket agent of the same road, in Nebraska and then for a short time was western land and passenger agent. His next position was general agent of the Michigan Central and the Chicago & West Michigan, at Grand Rapids, Mich. In 1876 he was appointed assistant superintendent of the Michigan Central at Jackson, Mich., and in 1878 he returned to Chicago as assistant general passenger agent of the same road. A few months later he went to the Chicago, Burlington & Quincy, as general passenger agent of that system. He remained in this position until April, 1881, when he was appointed general passenger agent of the Pennsylvania Railroad, and on June 1, 1903, was promoted to passenger traffic manager, from which position he retired on March 1, 1913.

J. R. Wood

Equipment and Supplies

LOCOMOTIVES

THE NORFOLK & WESTERN is asking prices on 30 Mallet type locomotives.

THE UNITED STATES GOVERNMENT has ordered one six-wheel locomotive from the Baldwin Locomotive Works.

THE SOUTHERN RAILWAY has ordered 2 eight-wheel switching locomotives from the Baldwin Locomotive Works.

THE GREAT NORTHERN has ordered 25 eight-wheel switching locomotives from the Baldwin Locomotive Works.

THE PHILADELPHIA & READING has ordered 20 Mallet (2-8-8-2) type locomotives from the Baldwin Locomotive Works.

THE AMERICAN RAILROAD OF PORTO RICO has ordered 2 six-wheel locomotives from the Baldwin Locomotive Works.

THE ALAPAEFF MINING COMPANY (RUSSIA) has ordered 9 six-wheel locomotives from the Baldwin Locomotive Works.

THE WESTERN CHEMICAL MANUFACTURING COMPANY, Denver, Col., has ordered one four-wheel locomotive from the Baldwin Locomotive Works.

THE INTERNATIONAL ENGINEERING & TRADING COMPANY (Russia) has ordered 2 six-wheel switching locomotives from the Baldwwin Locomotive Works.

LINDETEVES STOKVIS (of the Dutch East Indies) has ordered one eight-wheel locomotive from the American Locomotive Company. This locomotive will have 9½ by 14-inch cylinders, and will weigh 33,000 lb.

THE PARIS ORLEANS RAILWAY has ordered 50 Mikado locomotives from the American Locomotive Company. These locomotives will have 597 by 711 mm. cylinders, will weigh 200,000 lb., and will be equipped with superheaters.

THE PENNSYLVANIA LINES WEST have ordered 35 Santa Fe type locomotives from the American Locomotive Company. These locomotives will have 30 by 32-in. cylinders, will weigh 420,000 lb., and will be equipped with surperheaters. The Pennsylvania Lines West have also ordered 10 Mallet (0-8-8-0) type and 25 Santa Fe type locomotives from the Baldwin Locomotive Works.

FREIGHT CARS

THE NEW YORK CENTRAL has issued inquiries for 1,000 50-ton gondola cars.

THE RUSSIAN GOVERNMENT is securing prices on 3,000 or more four-wheel, 1,200 pood cars.

THE BOYNTON REFINING COMPANY has ordered 25 tank cars from the Pressed Steel Car Company.

THE CARNEGIE STEEL COMPANY is reported as having ordered 4 gondola cars from the Pressed Steel Car Company.

PENNSYLVANIA RAILROAD.—An order for the immediate construction of 25 all-steel cars of 200,000 lb. capacity each has been received by the Altoona shops. The cars are for the use of the United States Government, and will be used to carry heavy gun trucks and armor plate from the Bethlehem Steel Works to the seaboard.

PASSENGER CARS

THE ILLINOIS CENTRAL has issued an inquiry for 71 passenger cars.

IRON AND STEEL

THE NORTH AMERICAN CAR COMPANY has ordered from Joseph T. Ryerson & Sons punched plates for 30 tank cars, 213 tons.

THE PULLMAN COMPANY has ordered 615 tons of steel from the Kenwood Bridge Company for buildings E and C at the repair shops in St. Louis.

Supply Trade News

The Okonite Company, Chicago, recently moved its New York office to the Astor Trust building, 501 Fifth avenue.

The general office of the Union Spring & Manufacturing Company, Pittsburgh, Pa., has been changed from the First National Bank building to 1207 Fulton building.

The Pittsburgh Forge & Iron Company, Pittsburgh, Pa., announces the removal of its general offices on May 1 to the Chamber of Commerce building, Seventh avenue and Smithfield street.

B. T. Bectel, who has been in charge of the Pittsburgh office of the Mark Manufacturing Company, Evanston, Ill., since 1912 has been appointed assistant general manager of sales for this company, with headquarters at Evanston.

Announcement was made in last week's issue that Harry C. Quest, for a number of years a representative of paint and varnish companies in the railway supply field, had associated himself with A. A. Ridgway, under the firm name of Ridgway-Quest Company to manufacture paints and varnishes, at Chicago. Mr. Quest has been elected president of this company. He began his career in the railway supply business in 1901 with the Heath & Milligan Company, Chicago, and since then has been engaged in the sale of paints and varnishes to the railways, car companies and allied industries. The new plant of the Ridgway-Quest Company has been especially equipped for the production of these materials for the railway field. Mr. Quest will cover the entire United States. Branch offices will be established in New York City and Denver, Colo.

H. C. Quest

G. A. Cooper of the copy service department of the Simmons-Boardman Publishing Company, at Chicago, has been appointed a representative in the railroad department of the United States Graphite Company, with headquarters at Chicago.

Richard A. Van Houten, for the past four years sales agent of the Sellers Manufacturing Company, Chicago, has been appointed manager of the plant at Mayfair (Chicago), where he will have complete charge of manufacturing operations.

The American Steel Export Company, New York, announces the appointment of Charles S. Vought as assistant general manager of sales. Mr. Vought was formerly one of the managers of the order department of the Cambria Steel Company, and has been associated with the American Steel Export Company for some time.

In order to supply more readily the rapidly increasing demand for S K F bearings on the Pacific Coast, the S K F Ball Bearing Company, of California, Inc., has been organized. The main office of this company under the direction of A. M. MacLaren has been opened in San Francisco at 341 Larkin street. At this office a large and assorted stock of bearings will be carried, and the engineering services of the company will be available.

At a special meeting of the board of directors of the Independent Pneumatic Tool Company, Chicago, held on May 3, to elect a successor to its late president, James Buchanan Brady, John D. Hurley, vice-president, was elected president. R. S. Cooper, manager of the New York office of this company, has been elected vice-president, succeeding Mr. Hurley. Robert T.

Scott, manager of the company's Pittsburgh office, has been elected a director and member of the executive committee.

L. R. Pomeroy, consulting engineer, with office at 30 Church street, New York, died suddenly Monday morning. Mr. Pomeroy had been in the railway and railway supply business for more than 35 years, and had a very wide acquaintance. He was born at Port Byron, N. Y., in 1857, and was educated at Irving Institute, Tarrytown, N. Y. From 1880 to 1886 he was secretary and treasurer of the Suburban Rapid Transit Company of New York, and then for nine years he was with the Carnegie Steel Company, introducing basic boiler steel for locomotives and special forgings. Subsequently he engaged in the same kind of work with the Cambria Steel Company and the Latrobe Steel Company jointly. For three years to 1902 he was assistant general manager of the Schenectady Locomotive Works, and then for six years represented in the railway field the General Electric Company. Then he went to the Safety Car Heating & Lighting Company, and afterwards to J. G. White & Co. as chief engineer of the railway and industrial divisions. In June, 1914, he was appointed manager of the New York sales office of the United States Light & Heating Company, and later opened an office as consulting engineer.

L. R. Pomeroy

Railway Contractors Offer Services to Government

N. D. Ely, of Davenport, Iowa, went to the War Department with Senator Kenyon Tuesday and offered Secretary Baker the plants and trained railroad construction forces of the Walsh Construction Company and McCarthy Improvement Company of Davenport, and the Dunn-McCarthy Construction Company of Chicago for service in the United States, France, Russia or elsewhere. Mr. Ely said the three companies owned the largest railroad construction organization in the country.

All Hess-Bright Stock Now American Owned

In line with plans made last autumn when certain New York interests, including the National City Bank and Messrs. Brown Bros., bankers of New York, who were previously interested in the S K F Ball Bearing Company, also acquired an interest in the Hess-Bright Manufacturing Company of Philadelphia, it is now announced that plans have been perfected for a closer co-operation between these two concerns in the ball bearing industry.

The affairs of the two companies will be administered by a recently formed New York corporation, the S K F Administrative Company, of 1 Wall street. The board of this company consists of Frank A. Vanderlip, president of the National City Bank; Thatcher Brown, of Brown Bros.; F. B. Kirkbride, S. Wingquist, Axel Carlander; Marcus Wallenberg, a well known banker of Sweden, and B. G. Prytz, who as president of the S K F Ball Bearing Company has been active in bringing about the fusion between his company and the Hess-Bright company. Mr. Prytz has been elected president of the Administrative company.

Simultaneously Budd D. Gray, of the Hess-Bright company has resigned as president of the Philadelphia company, and will become technical advisor to the New York corporation, which will thus have the benefit of his experience in its various interests. At the board meeting of the Hess-Bright company on May 8, B. G. Prytz was elected to succeed Mr. Gray as president.

The S K F Administrative Company is extending the manufacturing facilities of both the Philadelphia and Hartford plants, and the demand for the company's products continues to be so far in excess of the present supply that it has been considered advisable to immediately make additions both to the S K F and Hess-Bright factories, in spite of the present building costs.

The closer co-operation between the two companies was greatly facilitated by the action of the American Hess-Bright stockholders in buying out the German minority interest in the Hess-Bright company shortly before the break with Germany, whereby all the stock came into American hands at what is reported to have been a very favorable price for the purchasers.

TRADE PUBLICATIONS

HEATING APPLIANCES.—A booklet recently issued by the Gold Car Heating & Lighting Company, New York, describes that company's thermostatic heat regulating system for public buildings, etc.

PUSH BUTTON SPECIALTIES for small power and light wiring, and remote control switches for industrial motors are described in catalogue No. 8, issued by the Cutler-Hammer Manufacturing Company, Milwaukee, Wis.

OXY-ILLUMINATING GAS APPARATUS.—Bulletin 101, recently issued by the Bradford-Ackermann Corporation, New York, is a four-page folder illustrating and describing the "Astra" oxy-illuminating low pressure gas apparatus designed for lead burning purposes.

RIVET CUTTING GUN.—The Rivet Cutting Gun Company, Cincinnati, Ohio, has recently issued a catalogue describing its so-called rivet cutting gun, a pneumatic tool for cutting rivets. The booklet contains a number of illustrations of the gun in use in cutting rivets on freight cars, etc.

DIRECT CURRENT MOTORS from 1½ hp. to 40 hp. are described and listed in the Bulletin No. 1,000 of the Eck Dynamo & Motor Company, Belleville, N. J. The motors included are known as type D, commutating poles, ventilated by internal fans and equipped with self-alining ball bearings.

PIPE TAPLETS, which include all kinds of conduit fittings, are listed and described in a 24-page bulletin issued by Hart & Hegeman Manufacturing Company, Hartford, Conn. The conduit fittings under the above trade name are manufactured by the H. T. Paiste Company, Philadelphia.

HOW TO KNOW AND HAVE GOOD LIGHTING is the title of a 50-page booklet on indirect lighting issued by the National X-Ray Reflector Company, Chicago. The applications of indirect lighting with X-Ray reflectors to widely different classes of illumination problems are described and elaborately illustrated in this booklet.

FLOOD LIGHTING.—The Crouse-Hinds Company, Syracuse, N. Y., has issued bulletin No. 302, 20 pages, describing its Imperial flood light projectors and Imperial reflectors. Several different types suitable for various locations on railways are described with tables and diagrams giving principal dimensions, weights, prices, etc.

PNEUMATIC TOOLS.—The Ingersoll-Rand Company, New York, has recently issued two new catalogues as follows: Form 3311, covering Imperial Type X Duplex steam driven compressors suitable for general industrial application of compressed air. The catalogue gives tables of sizes and capacities, and is thoroughly illustrated to show the machine in detail. Form 8507 covers Little David pneumatic drills. A large number of various types and models are shown with recommendations as to the particular character of work for which they are adapted. Each tool is illustrated, and the several tables give the sizes and capacity of each tool.

TEXACO AT HOME AND ABROAD.—The Texas Company has issued a very attractive 48-page booklet, 9 by 12 in. in size, telling about the Texas Company, what it does and where and with what efficiency its Texaco products are used. In the book, according to its preface, the company has "endeavored to sketch lightly with pen and pencil some of the interesting items about our business." Each page is devoted to an interesting phase of the company's business, some of them dealing, for example, with gathering the oil, transporting the oil, the refinery, Texaco in Panama, selling to the railroads, the dreadnaught, the fastest boat in the world; Texaco products in distant China, etc. Each page is illustrated with a single neatly done sketch showing an appropriate scene.

Railway Construction

CHICAGO UNION STATION COMPANY.—This company has awarded a contract to the W. J. Newman Company, contractors, Chicago, Ill., for the wrecking and removing of all buildings and other obstructions in the block bounded by Adams, Canal and Clinton streets and Jackson Boulevard, the site of the new head house of the new station. Completion of this work is required by September 2, 1917.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company has authorized the construction of a new freight house at Middletown, Ohio. The structure will be of brick and concrete construction, 40 ft. wide and 260 ft. long. The cost is placed at $30,000.

ELK FORK.—Incorporated in Kentucky with $25,000 capital and headquarters at Lexington, it is said, to build a 40-mile coal and timber railroad in Morgan and Elliott counties. The incorporators include: W. S. Whiting, Elizabethton, Tenn.; H. M. Collins, Frankfort, Ky.; W. R. Snyder, and J. F. Caywood, Lexington, and G. McLeod, Versailles, Ky.

GREAT NORTHERN.—This company has awarded a contract to Brown, Leahy & Fraser for the grading for new receiving and classification yards at Great Falls, Mont. About 15 miles of track will be laid in connection with the work. The yards at Wolf Point, Mont., will also be graded and new rail will be laid. Contracts for new buildings at this point were let to W. F. Hill, Superior, Wis. The cost of this and some miscellaneous improvement work in this vicinity is estimated at $300,000.

NEW YORK CENTRAL.—The Hudson River Connecting Railroad Corporation's application to the Secretary of War for permission to build a bridge over the Hudson river about 11 miles south of Albany, and 1 8/10 miles south of Castleton, has been approved, and it is proposed to build a combination steel truss and plate girder superstructure, carried on steel and concrete piers. The bridge will have two spans, one of 600 ft., full or 556 ft. clear, and another of 405 ft. total or 371 ft. clear, with a vertical clearance of 139 ft. at the center of the spans. It is understood that construction work on the new bridge will be pushed to early completion.

OREGON-WASHINGTON RAILROAD & NAVIGATION.—This company has awarded a contract to the Grant Smith Company, Portland, Ore., for filling three long trestles near Weston, Ore., on the Pendleton-Walla Walla division. The contract price is $110,000.

SALT LAKE & UTAH.—Contracts have been awarded by this company for a new line running from Hunter, Utah, about six miles south of Salt Lake City to Pleasant Green, involving nine miles of new construction. Work has already been started, and it is planned to rush it towards completion before winter sets in. The cost is estimated at between $300,000 and $400,000.

SOUTH FLORIDA INTERURBAN.—This company was organized under the laws of Arizona, it is said, and has filed its charter at Tallahassee, Fla. The plans call for building an interurban line from Melbourne, on the east coast of Florida, west to Haines City, with a connection north via St. Cloud and Orlando to Sanford, about 130 miles. It is understood that the work will be carried out this year. The line is eventually to be extended to the west coast of Florida. C. D. Brenner, president; J. H. Bowling, vice-president, and W. Hall, secretary. The headquarters of the company are at St. Cloud, Fla.

TEXAS ROADS.—Contracts have been awarded for the grading and bridging of a line extending from Dayton, Tex., through Mt. Bellview, and into the Goose Creek oil fields, 23 miles. The grading will average 7,500 cu. yd. to the mile; the maximum grade will be 0.3 per cent, and the maximum curve 2 deg. There will be about 30 wooden bridges. A depot and other terminal facilities will be built at Goose Creek. The line will be practically an extension of the Trinity & Brazos Valley, officers of which are incorporators of the new road. R. S. Sterling, president, 928 Chronicle building, Houston, Tex. (March 30, p. 725.)

Railway Financial News

CATSKILL MOUNTAIN.—Eli Joseph, of the Plaza Hotel, New York, who bid $28,300 for the Catskill Mountain Railroad at auction recently, has turned over his obligation to E. E. Olcott, president of the Hudson River Day Line, and George H. Beach. Joseph assigned his bid for $1,000. A new corporation is being formed to take over the Catskill Mountain, Otis and Catskill & Tannersville roads, and operate them as one system. Passenger service will start with the opening of the Day Line steamer service to New York.

DELAWARE & HUDSON.—President L. F. Loree at the annual stockholders' meeting on May 8, said that he had no reason to believe that the dividend was jeopardized. He added that income from the coal department should make up any deficiency from the operating end. Mr. Loree said that the coal department was now selling only from month to month, whereas a year ago it was selling under old contracts made when prices were lower, and that production had been restored to the old level. If the full 15 per cent rate increase applied for is granted, the Delaware & Hudson's net earnings would be put back where they were before the great increase in costs.

MARSHALL & EAST TEXAS.—This road which has been in the hands of Receiver Bryan Snyder since February, 1917, has been ordered sold at foreclosure on July 3 at the upset price of $500,000.

MISSOURI, KANSAS & TEXAS.—The Mercantile Trust Company has filed an intervening petition in the United States District Court in the receivership suit against the Missouri, Kansas & Texas to recover $128,375.34, which the trust company alleges is due on a loan. The petition states that the bank on May 1, 1913, loaned the railroad company $578,000, secured by bonds. September 1, 1914, a second loan of $380,000 was made. The sum sued for, the petition states, is the balance on the second loan, plus unpaid interest. The petition also asks that the trust company's rights be protected regarding the first loan in the reorganization plan of the railroad's finances.

NEVADA SHORT LINE.—This 12-mile road operating between Rochester, Nev., and Oreana, has been placed in the hands of Harry J. Humphrey, of Reno, Nev., as receiver.

NEW YORK, NEW HAVEN & HARTFORD.—Governor McCall has signed the "Five Per Cent" bill. The bill validates acts of the New Haven, particularly some of its purchases, and provides that it may pay a 5 per cent dividend on its stock.

The Supreme Court has dismissed a bill in equity filed by Ralph S. Bartlett and other minority stockholders for permission to bring suit for $102,000,000 in the name of the corporation against directors who served from 1904 to 1909 for alleged illegal expenditure in acquiring railroads, street railways and shipping enterprises in New England to stifle competition.

The Connecticut House has passed a Senate bill amending the charter of the New Haven so that it may issue $50,000,000 of 7 per cent preferred bonds, which, as the railroads' committee chairman explained, were necessary for financing the road, in order to meet a floating indebtedness of $45,000,000 next April. These outstanding notes will not be renewed by the bankers holding them.

NORFOLK SOUTHERN.—Stockholders of this company have authorized the issuance of notes aggregating $1,000,000, all but $174,000 of which will be invested in equipment that has already been ordered. The $174,000 will be used to retire Raleigh & Southport Railway bonds which mature soon. The new notes to be issued will mature in three years and will bear interest at the rate of 6 per cent.

TENNESSEE CENTRAL.—Receiving no bids at the third attempt to sell this road at auction, Special Master Doak has postponed the sale until June 2.